

# Customer co-creation in innovations : a protocol for innovating with end users

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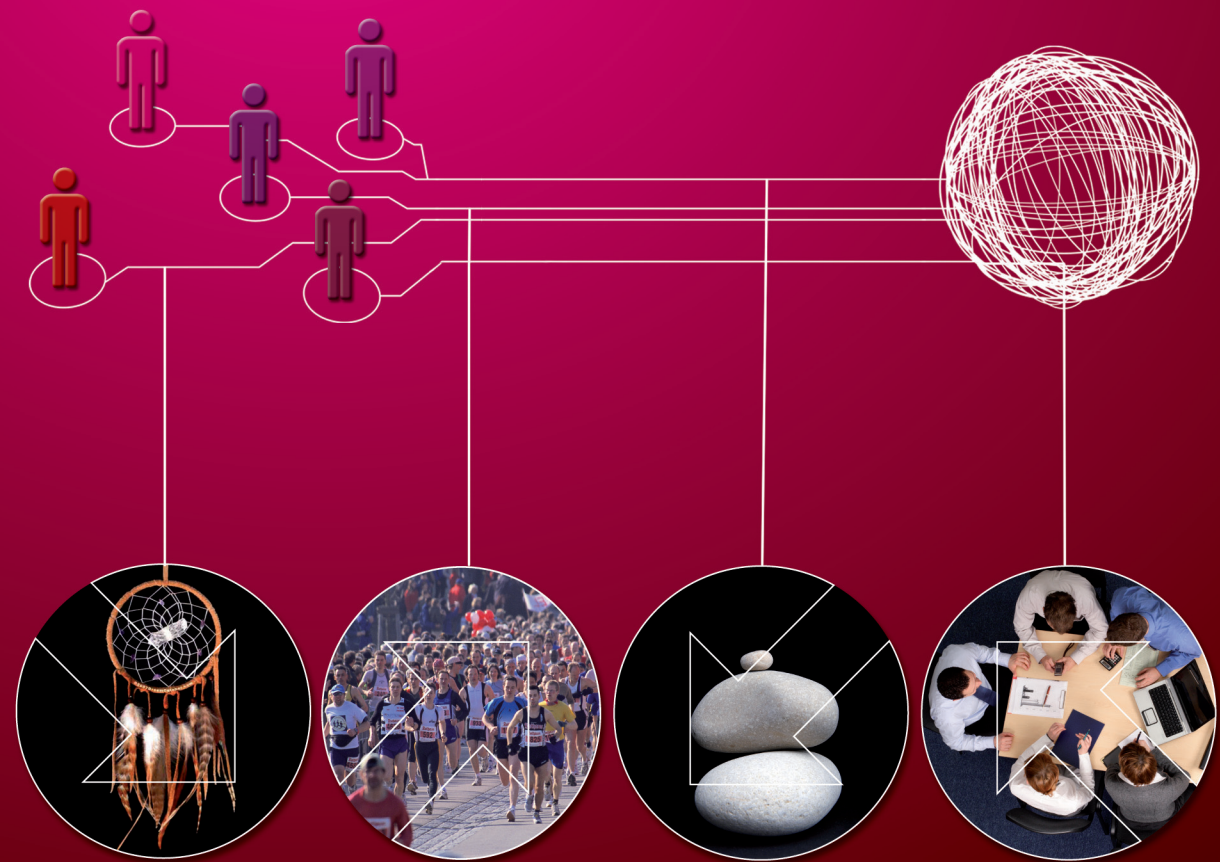
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# Customer Co-Creation in Innovations

A Protocol for Innovating With End Users



Marcel Weber

Customer Co-Creation in Innovations **Marcel Weber**

Customer Co-Creation in Innovations  
A Protocol for Innovating With End Users

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de  
Technische Universiteit Eindhoven, op gezag van de  
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door

Marcel Etienne Augustinus Weber

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prof.dr.ir. M.C.D.P Weggeman  
en  
prof.dr.ir. J.E. van Aken

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This doctoral journey started long before I finally enlisted and entered the procedural guidance of the Eindhoven University of Technology. It was somewhere at the end of 2004 where I got involved into some negotiation talks our CEO was having with the CEO of the High Tech Campus Eindhoven. The HTC was emerging profoundly at that time. The negotiations were about a possible collaboration of the HTC with Altuition. Altuition was really eager to achieve this, because the HTC was a gateway, or better a platform, to reach global operating high technology firms, which would serve the company's service track record. One of the areas where collaboration seemed opportune was the customer co-creation trend which emerged during that time. Contemplation, deliberation, and negotiation finally led to the Client Co-Creation Lab initiative, described in this thesis. But, it also aroused my interest because working with my clients' customers has always been challenging but pleasant as well. And it was more than fascinating to become aware of the potential that lies in these customers. It was as if I knew where the gold was buried, but had to find a way of digging it up. The wondering started, so I was extremely pleased to get the chance to translate this into a formal PhD research in finding the means to dig up the gold.

Conducting a research as presented here is a creative process. Creativity is widely viewed as an inescapable social process. Even a lone creator has to rely heavily on contributors and collaborators. Consequently, I have to recognize that this research could not have been done without the contribution and support of others. This is reflected in the way this research is presented. The reader may observe the plural style (we, us, our, etc.) to emphasize that this research is indeed the result of collective effort instead of a pure individualistic and egocentric trip.

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Waalwijk, January 1, 2011

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# Chapter 1 Introduction

## 1.1 Introduction to chapter 1

When reading, listening to, or watching business news today, we encounter many firm initiatives where customers are invited to participate in the creation of the firms' goods or services, advertisings, or other undertakings, e.g. Parmar 2009. Such firms turn to their customers for innovation purposes, and customers seem to be eagerly willing to participate. So, it looks like today's society is heading into a direction, in which consumers, users, existing and potential customers are recruited by firms to create, design and produce goods and services for their own use and consumption. We have thus entered an era in which users and consumers take part in the value creation processes of firms, either on their own initiative or on invitation by these firms, and thus creating and sometimes even producing their own goods and services. Initiatives by Adidas, LEGO Factory, Procter & Gamble, Nike and many other companies substantiate this trend where users and consumers are invited by producing firms to supply ideas for new products and services, sometimes to co-design and co-develop them, and, in a few cases, even to co-produce the goods and services. Co-creation means jointly performing creative tasks by two or more individuals or parties (Merriam Webster Online) and refers to creating art, products, value, etc. – simply to anything that requires creativity to be produced. But the term has been used lately in the sense that firms and their customers together co-create value, rather than that value is created entirely inside the firm. Customer co-creation therefore entails the active involvement of customers in the innovation activities of the firm (van Daelen, 2005). How should firms deal with this phenomenon? Is it a trend, in which it is destined that consumers will create their own offerings? Can any firm do this, invite its customers to co-create new products and services? And if so, how can these firms make use of this opportunity? This thesis will give the answers to these questions and provides firms and organizations that want to undertake the innovation journey with the aid of their customers, the necessary instruments to conduct this journey. The thesis is a synthesized result of an intensive study of initiatives in practice and investigations of academia on the subject of user or customer involvement in open innovations or, as we will call it, customer co-creation.

In this chapter the design and execution of the study will be outlined. First, we introduce the subject of the study and provide arguments for its focus. We will position the study against the background of literature (section 1.2). We will then discuss the state of existing research and the omissions in it (section 1.3). In that discussion we will cite the relevant literature to make our point. We will proceed by defining the research or design problem we want to address in this thesis (section 1.4). We will argue that although academics are addressing the issue of customer involvement in innovations more and more, up till now it has insufficiently provided practitioners with necessary methods and procedures to actively involve customers in the innovation process. Based on this last argument, we develop a central research problem. In section 1.5 we conclude with the outline of this thesis.

## 1.2 The rise of the 'prosumer'

Until the Industrial Revolution the vast bulk of all food, goods, and services produced by mankind was mostly consumed by the producers themselves or their families. Commerce existed, of course, but all this represented only a fraction, compared with the extent of production for self-use. Production and consumption were fused into a single life-giving function. The Industrial Revolution changed this situation and created a civilization in which almost no one was self-sufficient any longer. Everyone became almost totally

dependent upon food, goods or services produced by someone else. The difference between producer and consumer became manifest (Toffler, 1980).

Aside from the implications this had on technology, economics, politics, society, nature and culture, this movement called the Industrial Revolution also led to specializations in the production function, accompanied by the rise of professionalization, and thus fragmenting and concentrating product and production knowledge to the emerging professions, e.g. making the marketer the most knowledgeable on consumer and market behavior, the manufacturer knowledgeable on production techniques and technology, and the product developer the one who knows best what the product is made of. Value was created by firms. Customers were considered consumers of goods and services and they “destroyed” the value created by the producer (Ramírez, 1999). Accounting systems emerging at that time thus depreciated the value of what was acquired to zero over a shorter or longer depreciation period.

However, in the last two decades of the 20<sup>th</sup> Century, individual, societal, technological and economic changes, particularly caused by the rapid advances in the information technology, have led to a decrease of the difference between producers and consumers (Davenport et al., 2006; Senge et al., 2001). We can distinguish a tendency towards a market as existed before the Industrial Revolution, where consumers are producing their own food, goods and services, the so called *prosumer* (Toffler, 1980). Instead of destroyers of value, consumers now are viewed as co-creators of value (Ramírez, 1999). Value is not any longer only created in the supplier’s process of designing, manufacturing, packaging and delivering of market offerings, but also by the *customer’s processes* of consuming these outputs (Mitchell & Saren, 2008). The high costs — and poor results — of product development and introduction and low customer retention have led to the awareness that the corporate business model of mass production and mass consumption (supported by mass media marketing) are a poor fit for a population of consumers that is richer, better educated, and more time starved than any generation in history (Zuboff & Maxmin, 2002). Today’s customers are taught from an early age to think of themselves and their needs as unique and they expect tailored solutions from vendors, not mass market products. Mass customization, do-it-yourself, self-service and personalization are some of the ways, in which this phenomenon is expressed – the consumer or customer is given a part of the design and production process that was formerly owned and run by the producer. Examples are self-service fuel pumps, electronic banking, self-care and medication, the do-it-yourself home improvement in services, the design and creation of one’s own clothes (e.g. Spreadshirt), shoes (e.g. Nike, Adidas), toys (e.g. LEGO), dolls (e.g. Build-a-Bear), and the co-design of new hotels (e.g. Starwood Hotels), supermarkets (e.g. Superquinn). “Bachelors’ wives and maidens’ children are well taught” and, “the best horseman is always on his feet” are proverbs used to emphasize the old view that that knowledge about designing, developing and producing the goods and services has been the privilege of firms, even if consumers think otherwise. In modern society, however, customers really get the possibility to say what they really want and how they want it by creating it themselves. As customers become more informed, connected and active, with the ability, means and motivation to take control of their interactions with companies, companies are trying to escape traditional approaches of delivering products and services based on a firm-centric value creation process and move toward co-creating unique experiences at critical points of interaction with customers (Prahalad & Ramaswamy, 2003; Seybold, 2006; Seybold et al., 2001).

This co-creation also applies to the innovation activities of companies (Kanter, 2001). Until the beginning of the 21st century, innovation by firms has been based mostly on what Henry Chesbrough (2003) calls the Closed Innovation paradigm: a viewpoint that states that the innovation process of firm must be initiated, executed and managed by the firm itself. Chesbrough states that this paradigm has become obsolete and



unsatisfactory and therefore old fashioned. This because of the growing openness of organizations and, the high speed and frequency firms must reach in commercializing innovations. To survive in this nowadays climate he advocates the Open Innovation paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firm look to advance their technology and competitiveness (Chesbrough, 2003). In the development of this new theoretical framework on innovations, Chesbrough and many other authors elaborate on ways and means to create an open innovative climate within firms, concentrating mainly on co-operation in value networks, licensing of knowledge or new venturing and startups, in which, mainly the firm, industry, universities and research centers are involved (Chesbrough, 2003; Dittrich et al., 2004; Hagel & Brown, 2006; Henkel & Gruber, 2006). However, in this viewpoint of Open Innovation innovations are still considered the privilege of firms and industry, even though customers are seen as potential contributors in this paradigm. This means that the study of the general literature on Open Innovation is not helping us to find the answers for this co-creating trend that takes place with customers.

### **1.3 Brief overview of research and its omissions on customer involvement in innovations**

Customer co-creation in innovations is, as observed previously, the active involvement of customers in the firm's innovation process. The role of customers in innovations has been addressed in literature on the design and execution of the innovation process model and the success of innovations (Cooper, 1979b; Myers & Marquis, 1969; Rothwell et al., 1974), including the debate around the effect the marketing concept on the innovation strategy of the firm (Bennett & Cooper, 1981; Cooper, 1979a; Hayes & Abernathy, 1980; Kohli & Jaworski, 1990; Lawton, 1980)<sup>1</sup>. The traditional innovation process model illustrates a process that starts with the generation of ideas, undergoes a number of stages and finally leads to the commercial launch of new products (Cooper, 1996; Cooper & Kleinschmidt, 1993). This model focuses on different screening stages and involves only the partial involvement of customers at early stages by assessing their needs, usually through market research (Perunovic & Christiansen, 2005; Rice et al., 1998; Rothwell, 1994; Rothwell & Gardiner, 1985; Veryzer Jr., 1998b). While early models of innovation were focused on firm internal capabilities and R&D, later generations (starting with the third generation model) feature a more complex process of innovation, including internal as well as external sources of innovation alike, and emphasizing the importance of users in the innovation process (Holt, 1988). The innovation process turned into a multi-actor process which requires high levels of integration at both intra- and inter-firm levels and which is increasingly facilitated by IT-based networking (Rothwell, 1994). Yet, in this evolution customers and users are still allotted a passive role: their only role is to have needs, which manufacturers then identify and fill by designing and producing new products.

The idea of an active involvement of customers and users in innovations has caught academic attention with research of Eric von Hippel, a professor of the MIT. In the late 1970s he discovered that a large part of innovations by firms are accounted for by users and not by manufacturers solely (von Hippel, 1976; 1977; 1979). Users are firms or individual consumers that expect to benefit from using a product or a service; manufacturers expect to benefit from selling a product or a service; to comply with this setting manufacturers need to investigate the jobs that users want to perform and to develop the appropriate products for these jobs. Users sometimes take over the role of

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<sup>1</sup> We will elaborate on these literature further in the thesis.

the manufacturer when it comes to designing and developing new products, because they understand the job they need to perform better than the manufacturer does. Manufacturers passively wait for users to invent, design and develop new products, and then take over to commercialize the new idea. Von Hippel called this phenomenon the User Active Paradigm and asserts that users are a powerful source for innovations. Other authors also investigate the active involvement of users and customers and confirm the viewpoint that involving customers in the innovation process can be beneficial for firms, either in the case of developing new products for business users as well as consumers (Biemans, 1991; Cooper & Kleinschmidt, 1986; Feldman & Page, 1984; Gardiner & Rothwell, 1985; Gruner & Homburg, 2000; Martin & Horne, 1995; Parkinson, 1982; Pinto & Slevin, 1988; Rothwell et al., 1974) or for new services (Ennew & Binks, 1996; Kelley, 1992; Martin & Horne, 1995; Zeithaml & Bitner, 2003). There is even a growing body of empirical work which shows that customers and users are the first to develop many and perhaps most new industrial and consumer products (Lilien et al., 2002; Lundvall, 1998; Lundvall et al., 2002; Lüthje, 2004; Lüthje et al., 2005; Olson & Bakke, 2001; Prahalad & Ramaswamy, 2003). Further, the contribution of customers is growing steadily larger as a result of continuing advances in computer and communications capabilities (Chan & Lee, 2004; Füller et al., 2006; Nambisan, 2002; Sawhney & Prandelli, 2000). Yet, a first omission can be observed in respect of the clarity of the subjects which are being involved. Some research specifically focus on the role of "(end) users", e.g. von Hippel, that may or may not be existing customers of the firm, while other research refers to "customers" without clearly defining these subjects. A question that arises is for instance: Is such research referring to customers as individuals or organizations, to existing or potential customers, to the paying or the using customer? Until and unless we can provide the correct answers to such questions, we will use the generic term "customer" to depict all these possibilities.

There is, however, also a part of the academic world that warns for caution on the subject of relying too much on customers in innovations (Christensen, 1997; Christensen & Bower, 1996; Conway, 1993; Gardiner & Rothwell, 1985; Hamel & Prahalad, 1994; Macdonald, 1995; Martin, 1995). Customers can be protective or closed concerning their inventions or innovations (Rubenstein & Ettl, 1979), or simply can't be trusted concerning their commitment to participate in the innovation process (Esselman, 2006), often leading to a premature withdrawal from the process or a low productivity because of a lack of knowledge what to do (Martin et al., 1999; Ramírez, 1999). Hamel and Prahalad (Hamel & Prahalad, 1994) warn us of the tyranny of the served market. Bonner and Walker (2004) attempt to provide clarity with the finding that incremental innovation benefit best from involvement by existing, homogeneous customers, while heterogeneous customers served radical innovations best. But, on the other hand Un et al. (2010) find that firms that collaborate with customers benefit less from this involvement compared to collaborations with universities and suppliers, because of the difficulty to access customers' knowledge. Other research finding indicates that for customers to participate in innovation, the firm needs to supply at least a base product or service, that users and consumers can improve, implying that radical or completely new innovations by customers are not likely to happen (Gardiner & Rothwell, 1985; Shaw, 1985). Companies may also expect innovating customers to become competitors, when these customers start commercializing their own innovations, like in the case of British Aerospace creating a new business development department, especially for the commercialization of newly developed tools and machinery (Foxall & Tierney, 1984). Later research has investigated the inclination of such user-innovators to also commercialize or manufacture their new ideas themselves, i.e. that the users become entrepreneurs and competitors of existing firms. This research shows that innovating users do not automatically proceed to commercialize their ideas and become entrepreneurs (Baldwin et al., 2006; Hienerth, 2006). It seems that users innovate mainly because it is beneficial to themselves (von Hippel, 1988). So, literature diverges

in the viewpoint whether it is wise at all to involve customers in innovations, signaling that further research is needed to give clarity about when it is recommended to co-create and when not. We will categorize this as a second omission in literature.

Aside from these two omissions in literature, we can also observe a third one regarding the requirements towards the customer/user being involved in co-creation, which we will address as the type of customer. Research indicates that not all customers are capable of contributing in the innovation process. Some assert that customers that are involved in the innovation process must be lead users, meaning that (1) they face needs that will be general in a marketplace, but they face them months or years before the bulk of that marketplace encounters them, and (2) are positioned to benefit significantly by obtaining a solution to those needs (von Hippel, 2005), meaning that these users usually are professionals in the field of work of the product or service being innovated. Lettl et al. (2006a) add some more characteristics to this user profile, including an openness to new technologies, an embeddedness into a supportive context (resources, access to interdisciplinary know-how), and an intrinsic motivation, but still confirming von Hippel's finding that a lead user can only be found in the professional field. However, more recent research on customer involvement in the innovation of services, computer games and sports equipment contradicts the finding that only lead or innovative users should participate in this innovation. This research indicates that ordinary, less experienced users or even consumers that do not use the product yet, can generate more original or better ideas than professional users (Jeppesen, 2005; Magnusson et al., 2007; Magnusson et al., 2003; Shah, 2000). And, to complicate the discussion, the different phases of the innovation process require different skills and knowledge from the participating customers in the several phases (Alam, 2002; Enkel et al., 2005; Kaulio, 1998; Lengnick-Hall, 1996; Martin et al., 1999; Nambisan & Nambisan, 2008). Customers can therefore fulfill multiple roles in the innovation process (Nambisan, 2002; Seybold, 2006; Zeithaml & Bitner, 2003) implicating that one probably can not engage the same customers throughout the whole innovation process. In relation to the innovation process stage this insight requires a more specific qualification of the type of customer to involve than that literature presently provides. So, even if active customer involvement is beneficial, theory is ambiguous concerning the type of customers to involve.

To engage customers in co-creation, new product scholars and practitioners have proposed a range of successful techniques for obtaining customer input into product development processes, such as lead user analysis (Herstatt & von Hippel, 1992; von Hippel et al., 1999), mass customization (Berger et al., 2005; Gilmore & Pine, 1997; Peppers & Rogers, 1993; Pine & Gilmore, 1999), information acceleration (Urban et al., 1997), beta testing (Dolan & Matthews, 1993), consumer idealized design (Ciccantelli & Magidson, 1993), quality function deployment (Griffin, 1992), the ideal oriented co-design (Albinsson & Forsgren, 2004a; 2004b), participatory design (Damian et al., 1999; Greenbaum & Kyng, 1991), user communities (Piller et al., 2005; von Hippel, 2001a) and the use of online user toolkits (Franke & Shah, 2003; Franke & von Hippel, 2003; Jeppesen, 2002; Piller & Walcher, 2006; von Hippel, 2001b; von Hippel & Katz, 2002). However, most of these techniques and procedures are engineering driven and mainly relate to user engagement in the product design and manufacturing stage of the development process and apply to specific industries such as construction, engineering, and computer or software systems. In addition, some of them are most relevant for highly customized and complex products and may be applied mainly to product design and manufacturing activities. Few research has been performed on consumer goods (Lüthje, 2004). As for customer involvement in the innovation of services even fewer research is available (Alam, 2002). A recent meta-analysis of determinants of innovation performance reports that market synergy, which may include an understanding of customer needs, is a much stronger success factor for new services rather than for new

tangible products (Alam, 2002; Henard & Szymanski, 2001). Thus, one plausible conclusion is that customer involvement in the service innovation process is more important than for tangible product innovation (Sundbo, 1997). An assumption that we could make would be that the research findings for the innovation of products are applicable for service innovation (Voss & Zomerdijs, 2007). However, application of these aforementioned insights for innovation in technology products to service innovation results in ambiguous and sometimes contradictory findings. That raises the question whether other approaches should be followed when innovating in services.

We can conclude this research overview with the observation that literature exhibits several omissions or needs for further research with regard to clarity, idiosyncrasy and comprehensiveness of (1) the benefit of customer co-creation; (2) the state of "customership", meaning that it is not always clear whether we are talking about existing customers, potential customers, or even users; (3) the type of customer to engage in co-creation; and (4) the suitability and interpretation of this co-creation for all kinds of firms, including not-for-profit organizations.

## 1.4 Research question and design objectives

In the previous section we have argued that literature on customer co-creation in innovations, new product and service development (NPD/NSD) is inconclusive and ambiguous because studies vary widely in their elements and scopes, creating confusion for firms that want to make use of customers' involvement in their innovation projects. A firm could take all these findings in consideration when it wants to involve customers in an innovation, but first of all, it has to collect all these partial findings, interpret them in the correct way and, ultimately, try to integrate them in a comprehensive, firm-specific 'protocol'. Aside from being burdensome, this activity most probably will also lead to missing some aspects that haven't been covered by research yet. In addition, application of these findings does not guarantee success or prevent the failure of customer involvement. For instance, the participating customers seem to have trouble to understand what is expected from them (Berger et al., 2005; Martin et al., 1999) and tend to abandon the process before all required activities have been completed when an inappropriate approach or tactic is followed. More research on the reasons why and the circumstances in which customers disconnect is recommended, so that researchers can better understand why customers co-create, and why manufacturers gain better from customer ideas (Tietz et al., 2005). Research hasn't reached a sufficient level of completeness, comprehensiveness and applicability for firms to use when engaging and involving customers (Camarinha-Matos, 2009).

As it is being demonstrated constantly in current practice, management has discovered the phenomenon of engaging customers in innovations, but is in need of research of a prescriptive nature that can be applied in all kind of industries and contexts. Firms are in need of a comprehensive, robust protocol for engaging and involving customers and/or users in open innovations. A protocol which addresses the following (research) question:

*How can firms engage (i.e. get hold of the attention to participate) and involve (i.e. oblige to participate and co-create) customers in the innovation process in an effective way?*

This main question can be divided in the following sub questions:

- *When is it appropriate to engage and involve customers in open innovations of a firm?*
- *What kind of customers can be involved?*

- *In what parts of the innovation process is customer co-creation beneficial?*
- *Which process, procedures and methods should be followed?*
- *What are the tools to be used?*
- *What pitfalls or disadvantages exist in engaging and involving customers in this co-creation in innovations, and how can they be overcome and avoided?*

We can therefore formulate the following design objectives that have a prescriptive theoretical relevance:

**Design Objective # 1:** *To develop guidelines on how to identify, interest, and motivate (potential) customers to co-create in innovations.*

**Design Objective #2:** *To develop a way on how to engage and actively involve these customers in the innovation process in an effective way.*

### **1.4.1 Relevance**

Is innovation with or by customers or users a 'good thing?' Welfare economists answer such a question by studying how a phenomenon or a change affects social welfare. Toffler indicated that "the rise of the so called prosumer economics may turn out to be the first truly humane civilization in recorded history"(Toffler, 1980:27). With more people participating in value creation by the so called Creative Class (Florida, 2002) and Pro-Ams (Leadbeater & Miller, 2004), society benefits because social differences are bridged, people bond, and people from different backgrounds are connected. There will be more user innovations, more ideas for innovations, and more willingness to co-create enabled by technology, and democracy is enhanced through participation in pressure groups. Henkel and von Hippel (2005) explored the social welfare implications of user innovation. They found that, relative to a world in which only manufacturers innovate, social welfare is very probably increased by the presence of innovations freely revealed by users. There are three major reasons for this. First, user innovations tend to complement manufacturer innovations, filling small niches of high need left open by commercial sellers. Second, user innovation helps to reduce information asymmetries between manufacturers and users. Third, user innovations are more likely to be freely revealed than manufacturer innovations. One important policy implication is that the social welfare implications of policies that restrict product modification by users, or that allow manufacturers to do this, must be considered very carefully.

The success of an innovation depends on the way it fulfills the needs in the market. Designing and developing new products and services that do not take the market needs in consideration may lead to its market failure. Many failures of new products or services fail with the market introduction due to insufficient market orientation, marketing research (Cooper, 1979a; van der Panne et al., 2003) or customer value<sup>2</sup> (Ulwick, 2005). Such failures have social costs, in terms of economic waste. On top of these economic costs there are also emotional costs involved with unsuccessful innovations, the so called consumer or user sacrifices (Pine & Gilmore, 1999). Customers want products and services tailored to their needs (Peppers & Rogers, 1993; Pine & Gilmore, 1999; von Hippel, 2005; Zaltman, 2003) that enables them to get jobs done (Christensen & Raynor,

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<sup>2</sup> Customer value of a product is the sum of the benefits which a customer receives with the acquisition of the product, minus the invested costs (Treacy & Wiersema, 1995). Benefits entail the increase of status, position, reputation and experience of the customer. Costs consist of both financial costs to obtain and maintain the product, and the time spent on transaction, shortcomings and inconveniences.

2003; Ulwick, 2005). In some cases new products or services will be used by customers, just because there is no better alternative to get the jobs they want to perform done. In fact, the product or service does not totally meet the needs one has, but since one needs to the job and there is no other product or service that can get the job done as well, one is obliged to make a sacrifice (Pine & Gilmore, 1999). In other cases, if the customer is very committed and has certain knowledge on the product or service he's using, he might try to adapt the product or service to meet his needs (von Hippel, 2005), thus leading to extra effort and labor. Involving customers may reduce both economic and emotional costs, because customers find a way to guarantee the quality of the product or service being delivered (Martin et al., 1999; Nambisan, 2002). Besides product related benefits, customers also gain psychological benefits - e.g. it is intrinsically attractive to produce something for yourself (Franke & Schreier, 2006; Martin et al., 1999) - or social benefits, like peer recognition, community belonging, status, and identity (Florida, 2002; Jeppesen & Molin, 2003; Nambisan, 2002). Thus, engaging customers in co-creation can be beneficial to the success of the innovation.

All research seem to indicate that society, both on individual level as on community level, will prosper when customers participate in the innovation process of a firm. But attracting customers to take part in the design and development of products and services is not free of charge; firms have to take such costs in consideration. Firms can benefit from involving the customer, but need to do that in an efficient way, so the benefits received from a market success are not neutralized or surpassed by the cost of it.

To conclude with, social relevance of this design for an effective way to involve customers in open innovations lies in:

1. Firm managers will get a way to involve customers in an effective way also, so that total firm costs because of new product or service failure, or innovation failure most likely will be decreased.
2. Society encounters less waste than when a firm innovates on its own.

#### ***1.4.2 Design considerations***

The nature of this research will be prescriptive (van Aken, 2004), aiming to design a solution for firms that are interested in the role that customers can play in their organizations regarding innovations. The research strategy will therefore be based on the insights of the design science of research in management. The first issue in developing a research design is the design objective (van Aken, 2007). This research will result in a model or a protocol which organizations that want to involve customers in their open innovation process, can use or apply to effectively involve these customers. Effectively in this sense means that the innovations will be executed as an organizational project from idea through commercialization, i.e. the organization succeeds in bringing the innovation into the market or in use. This doesn't necessarily mean that the innovation will be a commercial success, because this success depends on more and other factors than just customer co-creation. But, in this context customer co-creation gives the organization the necessary confirmation that the innovation fits needs and demands in the market, and thus leads to a higher adaptation than one should expect when not involving customers.

#### ***1.4.3 Design limitations***

The focus of this research is on the design of a protocol. A protocol is a set of guidelines or rules. There are protocols for information technology and for human behavior. We will aim our protocol on the latter meaning, in this case meaning that we will aim at shaping

managers' behavior when they involve customers in co-creation in their innovation processes.

Protocols for human behavior are applied in diplomacy, medical contexts and in sciences. A protocol in science and medicine is a formal set of rules and procedures to be followed during a particular research experiment, course of treatment, etc. or a detailed plan of a scientific or medical experiment, treatment, or procedure (Merriam-Webster Dictionary). In medical science a clinical protocol or clinical practice guideline is a document with the aim of guiding decisions and criteria regarding trials, diagnosis, management, and treatment in specific areas of healthcare (ICH Expert Working Group, 1996). Modern medical guidelines are based on an examination of current evidence within the paradigm of evidence-based medicine (Hamer & Collinson, 2005). They usually include summarized consensus statements, but unlike the latter, they also address practical issues. In the natural sciences a protocol is a predefined written procedural method in the design and implementation of experiments. Protocols are written whenever it is desirable to standardize a laboratory method to ensure successful replication of results by others in the same laboratory or by other laboratories. Detailed protocols also facilitate the assessment of results through peer review. In addition to detailed procedures and lists of required equipment and instruments, protocols often include information on safety precautions, the calculation of results and reporting standards, including statistical analysis and rules for predefining and documenting excluded data to avoid bias. Protocols are employed in a wide range of experimental fields, from social science to quantum mechanics. Written protocols are also employed in manufacturing to ensure consistent quality. In this research we will not provide a very detailed protocol, in order to leave and give users the necessary freedom to act upon proceedings in its application. Thus, the protocol is not a prescription to be followed in a strict sense, but should be viewed as a set of general and procedural guidelines to involve customers in innovation co-creation.

As observed in 1.3 involvement of customers in innovations, although in a passive sense, is already being practiced and in our opinion sufficiently described in literature. We aim to focus our research on the active involvement, the so called customer co-creation in innovations. This should not be confused with von Hippel's notion of 'user innovation' since this is not co-creation. In this respect, following Kaulio (1998) we can distinguish innovations *for*, innovations *with* and innovations *by customers*. Innovations *for* customers entails the passive involvement of customers by assessing their needs and subsequently involving them in prototype or concept testing. Innovations *by customers* refers to von Hippel's user active paradigm where users modify existing or develop completely new products or services without interference from the firm. Our research scope is constrained to innovation *with* customers, indicating that there is an active participation of customers that collaborate with the firm in NPD or NSD.

Also, issues like implementation or organizational consequences will not be taken into account. We do acknowledge that the impact of customer involvement in NPD/NSD on organizational strategy, processes and structures can be profound (Alam, 2006a; Tidd & Hull, 2003). However, it is mostly dependent on the industry, the size, the culture, etc. of the company. At this point we will suffice in saying that consequences are addressed in a comprehensive manner by Davenport et al. (2006), Prahalad & Ramaswamy (2003), Chesbrough (2003;2007) and Chesbrough et al. (Chesbrough et al., 2006). The irony is that adopting the protocol is in a way an organizational, process or management innovation in itself (see 2.5.1). Involving the 'customers' of this protocol, which are the managers and, in some instances, employees that have innovation management on their agenda, in this innovation process, would be a requisite. For this the technique of Real Time Strategic Change (Bunker & Alban, 1997; Jacobs, 1994) would be very appropriate.

Nor will we address the choice of strategy, culminating in the choice of the business model. In order to even consider customer involvement or participation in innovation,

companies have to be aware of their dynamic environment and changes which have taken place in markets and with customers (Chesbrough, 2003; Davenport et al., 2006). We are now in a knowledge-networked society or new economy, where traditional business models and strategy approaches are insufficient for companies to prosper or even survive. In order to stay viable firms nowadays have to reinvent their business models, and changing them in new ways to achieve profitability, competitive customer value propositions, efficient and effective business processes, and learning and growth objectives where open innovation, co-creation with customers, and continuous innovation have become mandatory for firms (Chesbrough, 2007; Davenport et al., 2006; Prahalad & Ramaswamy, 2003; Senge et al., 2001). We will therefore assume that firms have this awareness and have taken or are in the process of taking the necessary steps to deal with these changes. Instead, we will look into the appropriateness of involving customers in the innovation in this context, that is firms that already dealing with open innovation.

There is also a discussion going about the ethics and pragmatics of involving ordinary people in professional businesses. There are schools that argue that involving the so-called crowd has negative effects on sustainability of firms and society (Keen, 2007), because the crowd is not really wise as is propagated by others (Howe, 2006; Leadbeater & Miller, 2004; Surowiecki, 2004). Although we will not address the societal and ethical aspects of involvement, we will assume that the customer collective or the "crowd" contains the solution or correct answer to companies' issues and problems. Bonabeau (Bonabeau, 2009) argues that thanks to recent technologies companies can now tap into "the collective" on a greater scale than ever before through use of information markets, wikis, crowd sourcing, "the wisdom of crowds" concepts, social networks, collaborative software and other Web-based tools to make decisions. But the proliferation of such technologies necessitates a framework for understanding what type of collective intelligence is possible (or not), desirable (or not) and affordable (or not) and under what conditions. At a minimum, managers need to consider the following key issues: loss of control, diversity versus expertise, engagement, policing, intellectual property and mechanism design. Understanding such important issues is necessary to successfully tap into the crowd for a variety of purposes, including research and development, market research, customer service and knowledge management. The bottom line he poses is that for many problems that a company faces, there could well be a solution out there somewhere, far outside of the traditional places that managers might search, within or outside the organization. For our protocol, this means that we will not propose that companies should grab whatever ideas or contributions that customers make, but that they, but that they should screen and judge these on their potential merits.

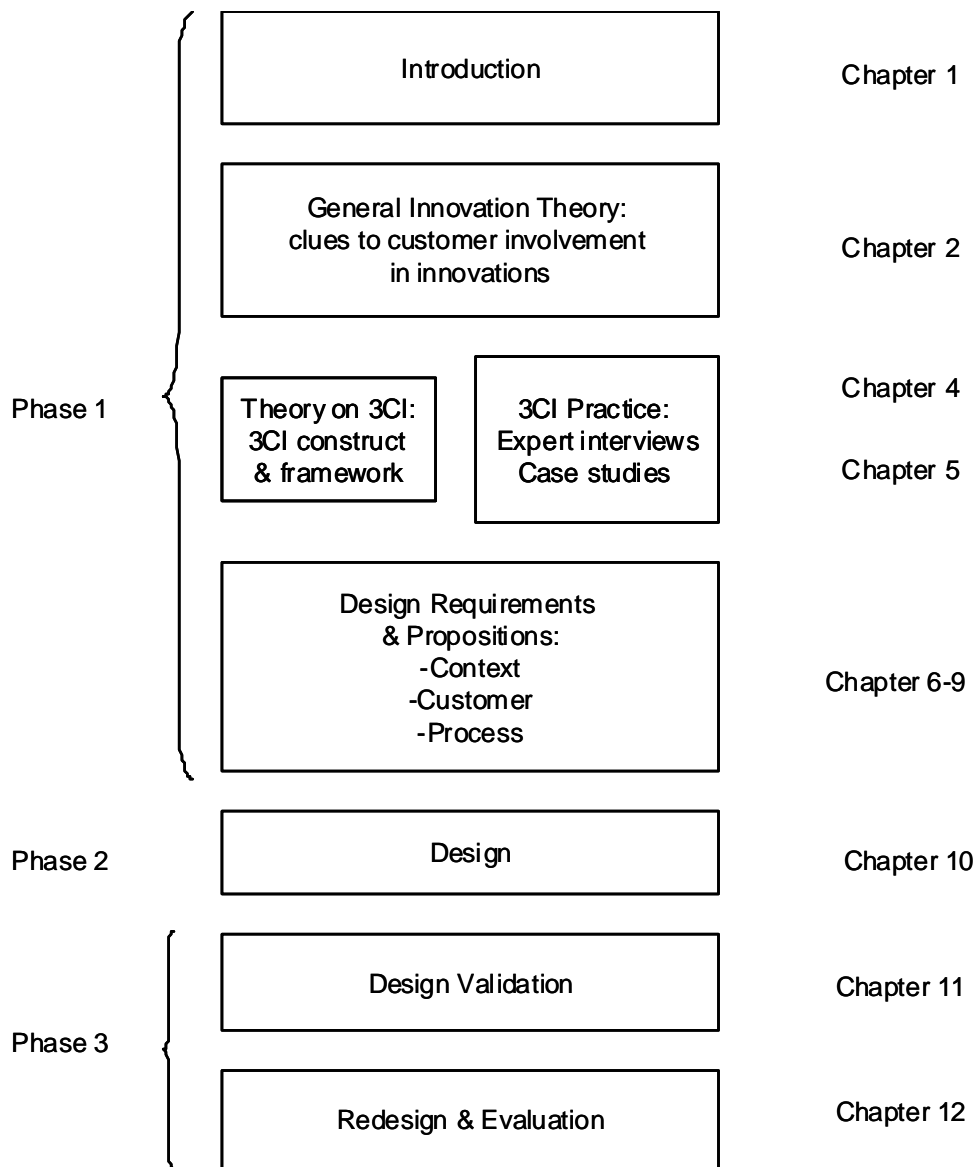
## **1.5 Outline of this thesis**

We start by reviewing relevant innovation theory to explore the antecedents of customer involvement and co-creation in innovations in Chapter 2. Following, Chapter 3 provides an overview on the design methodology and the design process in this case. Chapter 4 gives an overview of the theory on customer involvement in co-creation, along with an overview of its appearances, culminating in a definition for the construct of customer co-creation and a customer co-creation framework. In Chapter 5 we review the building blocks acquired from practice, by describing some practical cases and expert interview results. In the following four chapters (6, 7, 8 and 9) we enter the design process by developing our design requirements and design propositions. The design propositions, along with the protocol design requirements are synthesized in the generic protocol and some specific variants in Chapter 10. In Chapter 11 we validate and test the protocol. In Chapter 12 we reflect on the whole research, the design and their implications for further research and theory. To guide the reader in the interpretation of the diversity in terms used in this research project we have incorporated a glossary (Appendix A) defining the



most important terms in this thesis. The glossary is also a part of the finally obtained protocol (3CI-Protocol version 1.0 on page 395).

The whole thesis approach is depicted in Figure 1-1: Thesis outline.



**Figure 1-1: Thesis outline**

# Chapter 2 General innovation theory

## 2.1 Introduction to chapter 2

It is our intention of this chapter to set the boundaries to our research design: what parts, issues, etc. are relevant for our intended protocol. We will review the basic and modern theory on innovations in order to distinguish the factors, aspects, elements and processes of innovation that are affected by customer co-creation. It will address and define subjects which we later will refer to as the context and the process of our protocol. In this chapter we will also – unless mentioned otherwise – refer to the “customers” as individuals and organizations that will be or are targeted to adopt the innovation at a certain point, entailing as much as users, existing customers, potential customers or users, consumers and business customers.

## 2.2 Defining innovation

The pioneering work on innovation can be dated back to 1939, where Schumpeter in his publication *Business Cycles* (Schumpeter, 1939) recognized the importance of innovation in economies and made it a cornerstone of his theory of the capital process. He saw innovation as the element triggering most business cycles and defined innovation as follows: “... doing things differently in the realm of economic life ... ” (Schumpeter, 1939:84). This original definition from Schumpeter’s pioneering work has throughout the decades been developed and the definition of innovation is widely used today: Innovation is the process of making changes to something established by introducing something new; it could be a new idea, method or device that is consequently adopted and used in the marketplace. Definitions of innovation may vary in their wording, but they all stress the need to complete the development and exploitation aspects of new knowledge, not just its invention (Tidd et al., 2001). An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Tiwari, 2008). The minimum requirement for an innovation is that the product, process, marketing method or organizational method must be new (or significantly improved) to the firm. A definition that is nowadays widely accepted and used is an “invention implemented and taken to market”, according to John Seely Brown in his foreword to Chesbrough’s book on *Open Innovation* (Chesbrough, 2003:ix)

The goal of innovation is positive change, to make someone or something better. Innovation leading to increased productivity is the fundamental source of increasing wealth in an economy. In economics to be considered an innovation, the novum must increase value, customer value, or producer value. Innovation is a process of linking technical possibilities to market needs (Mowery & Rosenberg, 1979). According to Tuomi (Tuomi, 2002), innovation happens when social practice changes. If new technology is not used by anyone, it may be a promising idea, but strictly speaking, it is not technology. This view is important since it depicts that by defining innovation as something that generates and facilitates change in social practice, we put the user in a central place in the process of innovation. In a very fundamental sense, it is the user that determines whether something new is an innovation or not.

## 2.3 The imperative to innovate

Companies achieve competitive advantage through acts of innovation. They approach innovation in its broadest sense, including both new technologies and new ways of doing

things (Porter, 1990). Companies that do not innovate face a serious threat regarding their viability (Tidd et al., 2001). As a study by Utterback (1994) indicates, whole industries can be undermined and disappear as a result of radical innovation which rewrites the technical and economic rules of the game. Two worrying conclusions emerge from his work; first, that many innovations which destroy the existing order originate from newcomers and outsiders to a particular industry, and second, that a significant number of the original players survive such transformations. So the question is not one of whether or not to innovate but rather of how to do so successfully (Tidd et al., 2001).

Increasing competition and global over-supply in many industries have resulted in consumers expecting more. Customers now expect greater value from suppliers in terms of lower prices and higher quality (Doyle, 1998). Managers are now under intense pressure to create value. But value creation by improving operational efficiency—through such initiatives as outsourcing, business process reengineering and workforce reduction—has limits in terms of morale and potential. Companies must couple such efficiencies with innovation and new business development. Even the best companies have struggled to create new markets or sustain a high rate of commercially successful innovations (Prahalad & Ramaswamy, 2003). The drive to innovate is even more important in the knowledge-networked economy of the early 21<sup>st</sup> century, where the rapid sharing of knowledge forces players to reinvent and adapt constantly (Davenport et al., 2006).

Designing large organizations to generate streams of new products or services has been a central issue at least since Schumpeter (1950), who argued that large firms have the technological capabilities and infrastructure needed to innovate continuously. In support of Schumpeter's theory, studies show that large firms accumulate technology competences over long periods (Cantwell, 1989) and that organizational size and innovation are positively correlated (Camison-Zornoza et al., 2004). But many large organizations do not innovate effectively, in part because managers do not design them for innovation (Leonard, 1999). Organization science is also partly to blame because it offers managers incommensurable advice for designing organizations for innovation. Some argue that 'big is bad': mature organizations focus on legitimacy and on replicating structures and routines, not on innovation (Hannan & Freeman, 1984). Managers are told to innovate in renegade skunkworks, and to support 'heavyweight' project managers who force innovation through the rigid organization. Others argue that innovation is natural and will emerge normally if only managers let a thousand flowers bloom (Kanter, 1988). Some argue that innovation requires creative freedom (Amabile & Conti, 1999) while others argue that clear structures and procedures are essential (Adler, 2006). Some say that innovation must be separated from routine work (Tushman & O'Reilly, 1997) while others say that innovation must be integrated with other activities so that the organization can learn (Dougherty, 2006). The conflicts arise in part from a divergence in organization theory between social constraint and social action. While social constraint and social action are two sides of the same coin of social order, a tendency to separate them has always troubled social science (Giddens, 1982), and especially troubles organization theory (Schön, 1983; Weick, 2004). Taking a design science perspective Dougherty (Dougherty, 2008) derives three alternate construction principles that bridge social constraint and social action, just as they bridge theory and design, based on three generic properties of large innovative organizations, namely fluidity, integrity, and energy. Fluidity captures all the ongoing, dynamic adaptations in product teams, among businesses, and within and across technologies and other capabilities. Integrity captures the sense of pulling things together within and across levels of innovative work, like the integration of functions, organizational capabilities, knowledge domains, and technology. Energy emphasizes the idea that innovation workers need the emotional and physical wherewithal to do the work of innovation.

The alternate principles embody both the duality of social order (Giddens, 1982), and a human-centered view of organizing from design science (Boland & Collopy, 2004). Social

constraints are necessary because the work must be orchestrated, shaped, defined, and guided so that people can come together readily even if they do not know each other, can share key assets with others effectively, and can deal with the inevitable institutional pressures from regulators, competitors, and other social forces. Social actions are also necessary because innovation problems are unpredictable: people must improvise together in the situation since they cannot be told what to do ahead of time. Managers cannot force action and they cannot avoid constraint, so they need to constrain the organization to enable action (Dougherty, 2008).

## 2.4 Management of innovations

Thus, to survive in nowadays economy, firms must innovate, placing a high pressure on firms' leaders to maintain viability in the competitive landscape. The good news is that innovations can and should be managed (Tidd et al., 2001). Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced (Drucker, 1985). Tidd et al. (2001:19) suggest that "organizations have to manage four phases making up the innovation process. They have to (*abbreviated*):

1. Scan and search their environments (internal and external) to pick up and process signals about potential innovation.
2. Strategically select from this set of potential triggers for innovation those things which the organization will commit resources to doing.
3. Resource the option – providing (either by creating through R&D or acquiring through technology transfer) the knowledge resources to exploit it.
4. Implement the innovation, growing it from an idea through various stages of development to final launch – as a new product or service in the external marketplace or a new process or method within the organization.
5. A fifth – optional – phase is to reflect upon the previous phases and review experience of success and failure – in order to learn about how to manage the process better, and to capture relevant knowledge from the experience."

The third step, resourcing the initiative, entails not only internal but external resources including customers, as well. And although the first two steps are activities that the firm's management is responsible for, as we will discuss later, customers can also be involved in these steps.

Over the past 50 years or so there have been many studies of the innovation process, looking at many different angles. Different innovations, different sectors, firms of different shapes and sizes, operating in different countries, etc. have all come under the microscope and been analyzed in a variety of ways. One critical point to emerge from research is that innovation needs managing in an integrated way; it is not enough just to manage or develop abilities in some of these areas (Tidd et al., 2001). In addition, appropriate techniques and tools have to be applied (Feldman & Page, 1984).

We can conclude this section by stating that innovations can and should be planned and managed. Regarding this thesis it means that companies have the choice to start an innovation and resource it appropriately, eventually by involving their customers. Our scope will be the acquisition and management of customers as external resources in the innovation.

## 2.5 Classification or taxonomy of innovations

### 2.5.1 The object of innovation

A first aspect we can distinguish innovations by is the object of innovation, i.e. what is being innovated. The innovation can take two forms - in the things (products/services) which an organization offers, and change in the ways in which they are created and delivered. Traditionally these are termed '*product*' and '*process*' innovation (Tidd et al., 2001). A product innovation takes established offers in established markets to a higher or next level (Davenport et al., 2006), as when Intel releases a new processor or Toyota a new car. The focus can be on performance increase, cost reduction, usability improvement, or any other product enhancement. Process innovation makes processes for established offers in established markets more effective or efficient (Davenport et al., 2006). Examples include Dell's streamlining of its PC supply chain and order fulfillment system, Charles Schwab's migration to online trading, and Wal-Mart's refinement of vendor-managed inventory processes. Sometimes the dividing line (between product and process innovation) is somewhat blurred - for example, a new jet-powered sea ferry is both a product and a process innovation.

*Services* represent a particular case of this where the product and process aspects often merge - for example, a new holiday package could be viewed as a product and a process change (Davenport et al., 2006; Tidd et al., 2001). It is suggested that the term "product" is inappropriate for service providers; services are nowadays 'wrapped around goods' (Gilmore & Pine, 1997). Whereas in product offerings, clients play a singular role - that of customer - in services, clients play a dual role - that of customer and also that of co-producer in the offering (Athanasopoulou & John, 2004; Vargo & Lusch, 2004). With the rise of the Internet the scope for service innovation has grown enormously (Tidd et al., 2001). Technological developments have even blurred the boundary between products and service (Saco & Goncalves, 2008), e.g. the iPod. Mass customization automatically turns a good or product into a service, because finished goods are no longer inventoried, but assembled and delivered on demand (Gilmore & Pine, 1997). *Experiences* emerge when products and services are commoditized (Boswijk et al., 2005; Pine & Gilmore, 1999). An experience uses a good as a prop and services as the stage for engaging the customer in such a way that it creates a memorable event. Experiences are thus regarded as non-technological innovations of products and services, which increase the perceived value for customers (Engwirda & Ouwerkerk, 2002).

*Architectural* innovations entail the application of technological or process advances to fundamentally change some component or element of business (O'Reilly & Tushman, 2004). Innovation at the *integrated system* level usually takes place less frequently than at the component level, and has greater impact (Henderson & Clark, 1990).

Innovation can mean new products or services, but it can also mean new markets, new marketing channels, new marketing processes or new *marketing* concepts (Davenport et al., 2006; Doyle, 1998), like the use of the Web and trailers for viral marketing of the Lord of the Rings movie trilogy, Amazon's e-commerce mechanisms and eBay's online auctions. We should also be aware that innovation can take place by only repositioning the perception of an established product or process, changing customers' experience (Tidd et al., 2001), also called *experiential* innovation (Davenport et al., 2006; Engwirda & Ouwerkerk, 2002). Finally, Davenport et al. (2006) identify several other forms of innovations like application innovation (takes existing technologies into new markets to serve new purposes), and business model innovation (reframes an established customer need base, reinvents value proposition(s) to the customer, redefines a company's established role in the value system, or combinations of these).

Customers probably will be interested in what a firm produces and not how it produces the product. Services could form an exception on this assumption, since customers participate in the production of services. Thus, although we will be more interested in the involvement of customer in product and service innovation, because of the unclear distinction between product and process innovation, we will not exclude customer involvement in process innovations, as long as these process innovations are relevant for customers. In *marketing innovations* customers can also make contributions, so these kinds of innovations will also be subject of our protocol design. A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. Marketing innovations are aimed at better addressing customer needs, opening up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales (Tiwari, 2008).

### **2.5.2 The novelty of the innovation**

Innovation does not necessarily imply the commercialization of only a major advance in the technological state of the art but it includes also the utilization of even small-scale changes in technological know-how, better known as improvements or incremental innovations (Rothwell & Gardiner, 1985). So, a second dimension to distinguish innovations is the degree of novelty involved. Although novelty is usually associated with product newness (Avlonitis et al., 2001), which include a technology dimension, a market dimension and/or an organizational dimension (Danneels & Kleinschmidt, 2001; Garcia & Calantone, 2002), lately design newness is also becoming a critical and differentiating component of this construct (Talke et al., 2009). There are degrees of novelty in these, running from minor, incremental improvements right through to radical changes which transform the way we think about and use them (Garcia & Calantone, 2002; Tidd et al., 2001). Incremental innovations are small improvements in existing products and operations that let them operate more efficiently and deliver ever greater value to customers - radical or discontinuous innovations, on the other hand, are radical advances like digital photography that profoundly alter the basis for competition in an industry, often rendering old products or ways of working obsolete (Chandy & Tellis, 1998; O'Reilly & Tushman, 2004; Tushman & Anderson, 1986). Another term in use for radical innovations is *breakthrough products* (Leeman & Winer, 1997; Zhou et al., 2005), defined as those new products which create or expand a new category and/or create cross-category competition, are new to customers, often requiring substantial customer learning; raise issues related to channels of distribution and organizational responsibility; and create the potential for new infrastructure and add-ons (Deszca et al., 1999). They are associated with greater risk than less innovative products because they involve more uncertainty in terms of the nature of the product itself, market acceptance, the capacity to produce it effectively and efficiently, and profitability.

Two dimensions of product newness have been explored with respect to the effect of market orientation (Zhou et al., 2005). First, from the customer's perspective, product newness pertains to the extent to which an innovation is compatible with the experiences and consumption patterns of customers. It reflects the extent of behavioral change required by users for adoption of the new product (Lawton, 1980). Second, from the firm's perspective, degree of product newness refers to the degree of difference between an innovation and those already on the market. Innovations are thus categorized into reformulated new products such as line extensions and product modifications; and original new products such as new product lines and new-to-the-world products (Yoon & Lilien, 1985). According to Danneels and Kleinschmidt (Danneels & Kleinschmidt, 2001) customers themselves are the proper informants regarding how they perceive the novelty of a new product.

### 2.5.3 Market disruption of innovations

The classification in radical or incremental innovation should not be confused with the distinction between disruptive and sustaining innovations (Schmidt & Druehl, 2008). A *sustaining innovation* targets demanding, high-end customers with better performance than what was previously available (Christensen & Raynor, 2003). Some sustaining innovations are the incremental year-by-year improvements that all good companies grind out. Other sustaining innovations are breakthrough, leapfrog-beyond-the-competition products. *Disruptive innovations* (Christensen, 1997) or *structural innovations* (Davenport et al., 2006), in contrast, do not attempt to bring better products to established customers in existing markets. Rather, they disrupt and redefine that trajectory by introducing products and services that are not as good as currently available products. But disruptive technologies offer other benefits – typically, they are simpler, more convenient, and less expensive products that appeal to new or less-demanding customers. Once the disruptive product gains a foothold in new or low-end markets, the improvement cycle begins, and eventually they also meet the needs of more demanding customers. When that happens, the disruptors are on path that tends to ultimately crush its incumbents (Christensen, 1997; Davenport et al., 2006). Disruptive innovations have a high chance of creating growth. Generally speaking, these innovations offer low performance along dimensions that incumbent firms consider critical. In exchange, they introduce benefits such as simplicity, convenience, ease of use, and low prices (Anthony et al., 2006). The distinction between sustaining and disruptive innovation is important for innovators seeking to create new-growth business, whereas the current leaders of the industry almost always triumph in battles of sustaining innovation, successful disruptions have been launched most often by entrant companies. Disruption tends to have a paralyzing effect on industry leaders. With resource allocation processes designed to support sustaining innovations, they are constitutionally unable to respond. They are always motivated to go up-market, and almost never motivated to defend the new or low-end markets that the disruptors find attractive (Christensen & Raynor, 2003; Davenport et al., 2006). An innovation that is disruptive to one business may be sustaining to another – disruption is therefore a relative term (Christensen & Raynor, 2003). Distinguishing the one from the other is a matter of perception.

Abernathy and Clark (1985) create a model/framework for categorizing innovations, taking into account their effect on the outside environment of the organization. The model is presented in a 2x2 matrix, which they call Transilience Map (Table 2-1).

	Existing Technology	New Technology
New markets	Niche Innovation	Architectural Innovation
Existing market	Regular Innovation	Revolutionary Innovation

**Table 2-1: The Transilience Map**

Architectural and Niche Innovations are usually the result of discovering unique insights about user needs. Innovation is here evaluated in terms of its implication for the success or failure of the innovating firm in its rivalry with competitors: how it affects competitors.

Garcia and Calantone (2002) propose another typology where a similar distinction is made between new vs. existing technology and new vs. existing markets. A four-field matrix illustrates the argument (Table 2-2).

	Existing markets	New markets
New technology	Really new products or services	Radical innovation
Existing technology	Incremental innovation	Really new products or services

**Table 2-2: A proposed innovation typology (based on Garcia and Calantone, 2002)**

Based on the dimensions, three types of innovations are identified:

- 'Incremental innovations' incorporate product improvements (features, benefits, price, manufacturing, and process) into innovation using existing technologies targeted towards existing markets.
- On a macro level, 'really new' product innovation results in either market discontinuities or technology discontinuities but not both, and result in both types of discontinuities on a micro level. Really new products include new technologies in existing markets (product line extensions or new product lines) or existing technologies in new markets (also new product lines).
- On a rare occasion, a radical innovation will emerge. It will result in discontinuities in both the existing market structure and the existing technology structure. Examples of radical innovations are the steam engine and the World Wide Web.

#### ***2.5.4 Relationship between innovation classes and customer involvement***

The classification into different kinds of innovation does not imply that the one is better than the other, or that firms have only one type of innovation at their disposal. In general most firms will work on a portfolio of innovations, some of which represent incremental developments and improvements on existing and proven products and processes, whilst others will focus on more radical change. In fact often it is not possible in day-to-day innovation work to keep these categories separate; projects that were supposed to lead to an improvement in a product, end as a new development; radical innovation plans are abandoned half way along the project or are transformed into an optimization project etc. The discrete categories in which we pigeonhole business innovations become less relevant (Prahalad & Krishnan, 2008). One of the key skills in effective innovation management is balancing the composition of this portfolio and matching it to the firm's competencies and capabilities in technology and markets (Herstatt, 2002; Tidd et al., 2001). To flourish over the long run, most companies need to maintain a variety of these innovation efforts. All of them can have different targets. Some may be aimed at the current customers. Others may be delivered to an existing market that lies beyond a company's current customer base. Still others may be focused on serving an entirely new market that has yet to be clearly defined (O'Reilly & Tushman, 2004).

Based on Abernathy and Clark's Transilience Map (Table 2-1), Smedlund (Smedlund, 2008) developed a Transilience Map for professional services, indicating the degree of customer involvement or relationship in several types of innovation, see Table 2-3.

	Incremental innovation	Radical innovation
Strong relationship with customer	Tactical Service	High-potential service
Weak relationship with customer	Operational service	Experimental service

**Table 2-3: Classification of professional services (based on Smedlund, 2008)**

In an operational service, the professional service firm delivers a service off the shelf and the relationship with the client is weak, in most cases only the order and delivery of a service. The role of innovation in operational services is to improve the profit margins of the service with incremental and evolutionary changes to the existing routines that result in improved efficiency. The second type, labelled here as an experimental service, involves high market or technology uncertainty. The service produced is radically new to the market, but it solves a specific client problem. An experimental service may have a touch of architectural innovation (Henderson & Clark, 1990) in it. A tactical service is the cash cow of a professional service firm because of the strong client involvement,



combined with the operational characteristics of producing the service. Tactical services leave room for business model innovations, and profits are made by thinking of new ways of serving committed clients. This differs substantially from innovation in operational services, where the locus of interest is merely to improve the efficiency of the delivery of the service. The fourth category of professional services is labelled as a high-potential service. This service is a combination of radical innovation and a strong tie relationship between the client and the supplier, a combination that can be said to be rather rare in the economy of material goods. In this service, the client bears his part of the risk of innovation when a radically new service for the market is innovated. A high-potential service will potentially benefit both the client and the professional service firm in the future (Smedlund, 2008).

## **2.6 The sourcing of the innovation: open innovation**

Subsequently, we can also observe a difference between open and closed innovations. Closed innovation is a viewpoint that says that for successful innovation companies must generate their own ideas and then develop them, build them, market them, distribute them, service them, finance them, and support them on their own (Chesbrough, 2003). Characteristic of early theoretical approaches, such as Schumpeter's (1939) is that only one actor, an individual or company, is considered responsible for the innovation process, i.e. closed innovation. Open innovation, on the other hand, is a new paradigm (Kuhn, 1962) that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firm look to advance their technology (Chesbrough, 2003). Ideas can still originate from inside the firm's research process, but some of those ideas may seep out of the firm, either in the research stage or later in the development stage. A leading vehicle for this leakage is a start-up company, often staffed with some of the company's own personnel. Other leakage mechanisms include external licensing and departing employees. Ideas can also start outside the firm's own labs and can move inside (Chesbrough, 2003), or originate from the market, and emerge initially as problems faced by customers which are subsequently translated into a rough sketch of a product (den Hertog & Huizenga, 2000). In this sense innovation emerges from a continuous communication with customers. More precisely, when guided by Open Innovation principles, companies can commercialize ideas outside its internal development and market pathways, as well as using those pathways for bringing externally generated ideas and inventions to the market.

It is only in more recent innovation theory that innovations are recognized to involve more complex and disorderly interaction processes among several actors. Network theory was among the first to emphasize this (Håkansson, 1987). The roles of interactivity, interrelatedness and interdependency where many actors, including users and customers are involved have now become central in innovation theory (Harty, 2010). Future systems should aim at giving the customer, as well as the involved enterprises a new role, i.e. making them partners within a co-creation/co-innovation network (Camarinha-Matos, 2009). The co-innovation network comprises a network of enterprises (designers, manufacturers, brokers, etc.) merged with a network of (lead) customers, that is supported by an adequate collaboration platform and infrastructure.

Open innovation appears to be a good model for pursuing more radical innovations. Compared to incremental innovations, more risk is involved in radical innovations. Because many traditional methods for selecting ideas are based short term metrics, these radical innovations are often abandoned. When working together with other parties, and with the opportunity to license a technology to other parties, the risk of developing radical innovations can be decreased. Furthermore, radical innovations require expanding a companies' domain, which makes it more likely that a company

needs partners from other fields to speed up and improve the development process (Chesbrough, 2003).

Contrary to the strategic choice companies have in regard of radical or incremental, product or process, disruptive or sustaining , architectural or systems innovation open innovation is an imperative, as has been stated before, a paradigm shift in innovation management – closed innovation is no longer an option for organizations (Chesbrough, 2003). Companies can no longer focus only on efficient *intra*-organizational knowledge creation and sharing, but should also include the *inter*-organizational realm, as well as other relevant stakeholders in its business ecosystem, like various startups, universities, research consortia, incubators and other outside organizations (Davenport et al., 2006). To survive and thrive in an increasingly turbulent landscape, it has become necessary to create new relationships and new mental space with diverse members in the socio-cultural business system that includes employees, partners, suppliers, competitors, and most importantly, *customers* (Chesbrough, 2003; Davenport et al., 2006; Tapscott & Williams, 2007). Customers know more about their context, their desired outcomes, their needs, and their constraints than firms can ever hope to learn (Seybold, 2006), making them an almost not to be neglected source for firms that decide to undertake the journey of open innovating (Tapscott & Williams, 2007).

The open innovation paradigm goes beyond just utilizing external sources of innovation such as customers, rivals, and universities, and is as much a change in the use, management, and employment of Intellectual Property (IP) as it is in the technical and research driven generation of IP (West & Gallagher, 2006a), see also Box 2-1. Open innovation is also described as *mass collaboration*, *peer co-creation* (Tapscott & Williams, 2007), where it is suggested that firms should source masses of users, scientists, professionals, suppliers, and competitors, which in some way share the same interests for innovation purposes, instead of sourcing a single or only a few external parties. Examples like open source software and communities of practice (e.g. InnoCentive) exemplify this notion. We can observe at this point that “open” can refer to the active participation of only a few up to many external actors, either regarding the diversity (i.e. diverse types of participants, such as suppliers, customers, competitors, universities, etc.) or the amount of participants, thus creating a certain scale for “openness” of the innovation. We will elaborate on its implication in a later chapter.

Another implication of the Open Innovation paradigm is that the innovation process has become so complex that simple models of innovation process that do not take the complex social interaction between several parties into consideration become inadequate. We will address this issue in the next section about innovation process models (see 2.7).

We can thus observe that customer co-creation in innovations is open innovation in Chesbrough’s sense of Open Innovation<sup>3</sup>. Closed innovation in its purest sense means excluding any external source or resource when innovating. We will therefore focus on open innovations only in our research, where open can be plotted on a scale starting at only a few, climbing to innumerable external participants.

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<sup>3</sup> Recall our definition of customer co-creation: the active involvement of customers in the innovation activities of a firm. Active involvement in this sense means that knowledge and ideas *from* customers are used, and does not include traditional market research where knowledge *about* the customer is collected (see also section 4.4).

### [What's so open about open innovation?](#)

Although this was the [7th year](#) for the User Innovation workshop, it was only the second year in which open innovation was explicitly listed as a topic in the CFP. Although [last year's workshop](#) at Harvard was officially the "User and Open Innovation" workshop, it felt a little awkward being there [as a keeper](#) of the open innovation flame, as many of the "open innovation" papers were not consonant with the [Chesbrough definition](#).

This year, there were more papers on open innovation (as defined [by this blog](#)) and the user innovation researchers seemed more open to open innovation researchers and their participation.

That said there is still a gap between how Chesbrough used the term "open" and how other researchers on distributed innovation use the term. For the latter, "open" is often a synonym for free, as in the communitarian (or [communal](#)) mindset of the Free Software movement. Much of the research on user innovation examines cooperative user production of goods that parallel Free Software.

Since I've done a fair amount of research on [open standards](#) and [open source](#), I've been long aware that the "open" in open innovation is different. In fact, in [a 2007 paper](#) in *First Monday* (based on [an earlier conference presentation](#)) contrasting these phenomena, I wrote:

"A lot of open source and open standards participants wonder what's "open" about "open innovation." After all, both of the former have a shared or public goods element to them, whereas a prime goal of open innovation (as defined by Chesbrough, 2003) is that firms have a way to capture a private return. In fact, in [West and Gallagher \(2006\)](#) I argue that the purest forms of open source or free software (such as Project GNU) are specifically not open innovation. ...

Open innovation is not "open" like the other two. If anything, open innovation brings a note of realism to the discussion of open standards and open source, by putting the profit motive front and center. ...

Conversely, open standards and open source provide existence proofs for building effective institutions that align and coordinate the interests of potential competitors. For example, the open source license provides a "credible commitment" to make it less likely that commercial interests will under-invest in specific technologies."

Still, there is a ways to go to bridge the open innovation and user innovation research communities.

At UOI 2009, someone more savvy than I remarked to Eric von Hippel that he did not use the term "open innovation" in his 2005 book [Democratizing Innovation](#), but instead "open and distributed innovation." If you search [the PDF](#), the phrase appears 3 times and "open innovation" not at all.

I briefly discussed the boundaries of open innovation with Prof. von Hippel at UOI 2009, who said that his use of "open" referred to free information and said the Chesbrough usage was more about "IP markets." I replied that the "open"-ness of open innovation was as in permeable firm boundaries of "open systems" theory (think Dick Scott and [his book](#) dating back to 1981).

When I asked von Hippel about user innovators who charged for their innovations — as in [his paper](#) from the Statistics Canada survey — he said that by his definition that was certainly user innovation, but not "open." As suggested by his 2005 book, von Hippel's interests today lie in users solving their problems and sharing those solutions, more than the commercialization of user innovation (which in some ways is more consonant with the open innovation paradigm).

For me, this is additional motivation (as if I needed any) to publish my work with Marcel Bogers [contrasting user and open innovation](#). These communities of researchers (and their corresponding phenomena) have important overlaps, even there are important differences (which is why they are separate theories).

Posted by Joel West at [12:25 PM](#)

### **Box 2-1: Is User Innovation the same as Open Innovation?**

(Source: <http://blog.openinnovation.net/2009/06/what-so-open-about-open-innovation.html>)

Different types of innovations are distinguished by different dimensions, so there may be an overlap. The point we are making by describing these kinds is that although academic literature is very clear about the distinction, in practice we will not always be able to classify an innovation exclusively to one class. It is the perceived degree of novelty, openness, disruption, or business which matters; all these classes are very much in the eye of the beholder (Garcia & Calantone, 2002; Tidd et al., 2001). Even when it comes to involving external stakeholders, like customers, it is observed that there are several modes to do this – it can be done with just one or a few customers, in contrast with many, and it can also be done in a very closed mode, where participation is done by

firm's invitation, preventing the external environment, e.g. competitors, to observe the initiative, as opposed to a very open mode where there are hardly any restrictions to be involved (Pisano & Verganti, 2008). One must, however, be aware it is usually the combination of multiple external sources – and not just a single source – that determines the success of the innovation (Gemünden et al., 1996) requiring the management of such different sources as a whole. Customer or any other external participation can also entail the complete innovation process, or just a part of it, and still be considered open. We will address these possibilities in our research.

## **2.7 The innovation process**

Of the three cornerstones for NPD-success – strategy, resources and process – process is the most important, that has the most impact on the new business's new product performance (Cooper, 1996). The importance of understanding innovation as a process is that this understanding shapes the way in which we try and manage it. This has changed a great deal over time. Early models (both explicit and, more important, the implicit mental models whereby people managed the process) saw it as a linear sequence of functional activities. Either new opportunities arising out of research gave rise to applications and refinements which eventually found their way to the marketplace ('technology push') or else the market signaled needs for something new which then drew through solutions to the problem ('need pull', where necessity becomes the mother of invention) (Tidd et al., 2001), but for the success of innovations an interaction between the two is required (Davenport et al., 2006).

The literature features numerous process models that describe how companies develop or should develop new products or services. Virtually every management handbook provides a process model to visualize product development activities. Empirical studies in the field of innovation management represent observed activities in the form of process models. Companies develop process models to standardize their innovative efforts. The major benefits of implementing a new product development process are, in rank of order: (1) improved teamwork; (2) less recycling and rework; (3) improved success rate; (4) earlier detection of failure; (5) better launch, and; (6) shorter elapsed time (Cooper & Kleinschmidt, 1991). Herstatt and Verworn (2004), and Rothwell (1994) provide us with an overview of these process models, of which we will give a summary in this subsection.

### ***2.7.1 Taxonomy of process models***

Normative models are often derived from practical experience, case studies or quantitative studies analyzing successful new product development. Approaches found to be successful are condensed in an ideal process model. Normative models can provide the basis for process clarification and systematization in companies. In this case, process models fulfill the function of a management tool (Bernasco et al., 1999; Cohen et al., 1998; Cooper & Kleinschmidt, 1991; Herstatt & Verworn, 2004; Hughes & Chafin, 1996; O'Connor, 1994). In contrast, descriptive models evolve from empirical studies and are not intended to advice managers. Their objective is to describe and evaluate actual practice. Prescriptions for structuring the process abound; for example, one the most cited models for product innovation is due to Booz Allen and Hamilton (1982). Many variations exist on this theme – for example, Robert Cooper's work suggests a slightly extended view with 'gates' between stages which permit management of the risks in the process (Cooper, 1994).

The literature often provides multiphase models which break the new product development process into sequential tasks. They differ with regard to the objective, level of detail and the main focus chosen. The lower the level of detail, the higher the compliance with other models and with real new product development processes. On the

other hand, models with a low level of detail may lack specificity. Throughout the years, the normative multiphase model has lapsed five generations (Herstatt & Verworn, 2004; Rothwell, 1994). We will base our following elaboration on these last two sources.

### ***2.7.2 Five generations of innovation process models***

The first-generation “phase-review-processes” were developed by NASA in the 1960s and were intended as a management tool. Development was broken into sequential phases to systematize and control work with contractors and suppliers on space projects. Inputs and outputs for each phase were defined and a management review was held at the end of every phase to decide on the continuation of a project (“go-no-go”). The phased approach ensured that tasks were completed. This could make for delays, due to the fact that activities were put on hold until every task part of the next management review was completed. Another shortcoming of the phase-review-processes was that they only dealt with the development phase and not with the complete innovation process from idea generation to launch. Marketing activities were neglected.

The second-generation process models resulted from empirical studies on success factors for new product development (Myers & Marquis, 1969), the British SAPPHO studies (Rothwell et al., 1974), in particular from the Canadian NewProd studies by Cooper (Cooper, 1979b). In Cooper’s vision the product development process starts with an idea originating from basic research, *customer-based techniques*, and creativity techniques (Cooper & Kleinschmidt, 1990). There are 5 stages and 5 gates for decisions. Second-generation stage-gate processes resemble first-generation phase-review-processes but overcome some of their disadvantages. Again, the innovation process is broken into discrete stages. However, in contrast to the phase-review-process, a stage-gate-process integrates the engineering and marketing perspective. Decisions at gates are made by multifunctional teams according to well-defined go/kill criteria. In addition, the stage-gate-process covers the whole innovation process from idea generation to launch. The process is not strictly sequential, parallel activities are permitted to speed up the process (Cooper, 1994; Cooper & Kleinschmidt, 1990; Herstatt & Verworn, 2004).

Cooper’s normative third-generation stage-gate-models strive for more flexible processes (Cooper, 1994;1996). Third-generation stages and gates are not strictly sequential and less stringent than second-generation stages and gates. They are rather guidelines than strict rules how to operate and adapted to the level of risk inherent in a project. To speed up the product development process, transitions between stages are fluent and tasks are to an increasing degree performed in parallel (Cooper, 1994;1996). The third-generation stage-gate-process is closer to reality and therefore the effort to implement it in a company is smaller (Herstatt & Verworn, 2004). Following Cooper’s stage-phase models several scholars have developed normative process models – which are only mentioned, and not elaborated in this case – like concurrent engineering (Deszca et al., 1999; Swink, 1998), the value proposition cycle (Hughes & Chafin, 1996), and the contingency approach (Song & Montoya-Weiss, 1998).

The fourth-generation process model emerged in the early 1980s and lasted till the early 1990s. The early 1980s heralded a period of economic recovery with companies initially concentrating on core businesses and core technologies (Peters & Waterman, 1982). This was accompanied by a growing awareness of the strategic importance of evolving generic technologies, with increased strategic emphasis on technological accumulation (technology strategy). The emergence of new generations of IT-based manufacturing equipment led to a new focus on manufacturing strategy (Bessant, 1993). The notion of global strategy emerged (Hood & Vahlne, 1988), and there was a rapid growth in the number of strategic alliances between companies (Contractor & Lorange, 1988; Dodgson, 1993; Hagedoorn, 1990), often with government encouragement and support (Arnold & Guy, 1986; Hasklisch et al., 1986; Rothwell & Dodgson, 1992). Not only large firms, but

also innovative small firms were engaging in intensive external networking activity (Docter & Stokman, 1987; Rothwell, 1991). Shortening product life cycles meant that speed of development became an increasingly important factor in competition leading firms to adopt so-called time-based strategies (Dumaine, 1989). A crucial feature of this period was the recognition in the West that the remarkable competitive performance of Japanese companies in world markets was based on considerably more than the combination of technological imitation, JIT relationships with primary suppliers and efficient, quality-oriented production procedures. The Japanese, it was realized, were powerful innovators in their own right and there were features of the Japanese new product development system that enabled them to innovate more rapidly and efficiently than their Western counterparts. Two of the salient features of innovation in leading Japanese companies (the basis of the fourth-generation innovation model) are integration and parallel development. Innovating Japanese companies integrate suppliers into the new product development process at an early stage while at the same time integrating the activities of the different in-house departments involved, who work on the project simultaneously (in parallel) rather than sequentially (in series). This so-called "rugby" approach to new product development (Imai et al., 1985) is one of the factors contributing to high Japanese production efficiency through the process of "design for manufacturability". Even when completely simultaneous development is not possible or, as in the case of science-based sectors such as pharmaceuticals not necessary, a degree of functional overlap with intensive information exchange is essential.

The fifth generation process represents an integrated systems learning (ISL) model. This generation of innovation processes is driven by a much greater utilization of electronic technology to create internal and external linkages. Generally this requires a much higher collaborative approach to innovation and involves strategies such as joint ventures and strategic alliances. Linkages such as between a supplier as a part of extended CAD system to co-develop new products, or between design agency and manufacturing become norms rather than anomalies (Ahmed, 1998). Co-development is when a company, together with its customer or users, evaluates a new technology together with established work practice. Direct collaboration around the use of technology in actual work settings enlarges and enriches the work practice of both parties (Matthing et al., 2004). Table 2-4 summarizes these five generations.

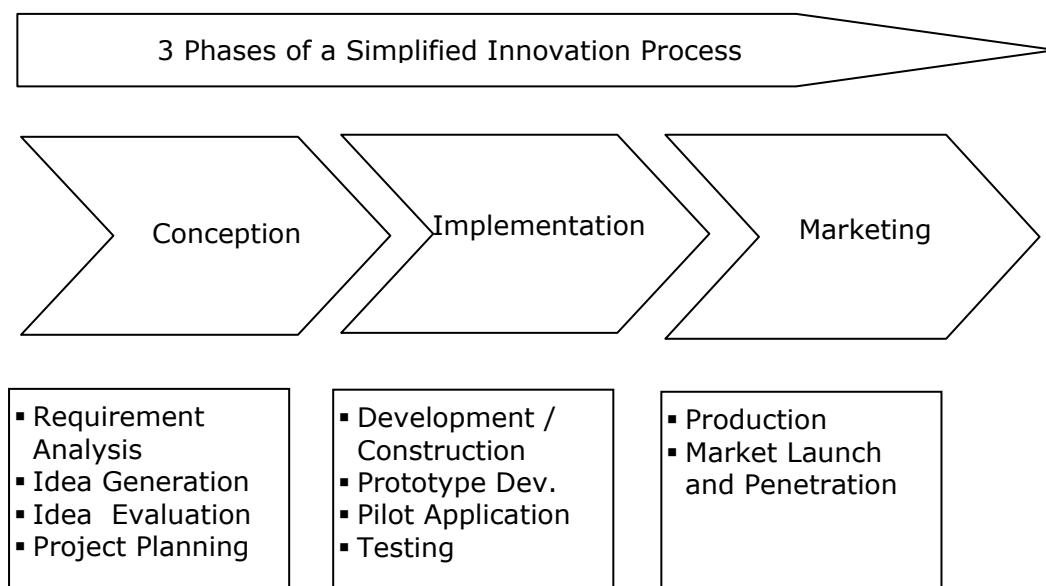
Generation	Key features
First/second	Simple linear models – need pull, technology push
Third	Coupling model, recognizing interaction between different elements and feedback loops between them
Fourth	Parallel model, integration within the firm, upstream with key suppliers and downstream with demanding and active customers, emphasis on linkages and alliances
Fifth	Systems integration and extensive networking, flexible and customized response, continuous innovation

**Table 2-4: Five generations of innovation process models (Rothwell, 1994)**

### ***2.7.3 A generic innovation process model***

Innovations vary widely, in scale, nature, degree of novelty and so on – and so do innovating organizations. But at this level of abstraction it is possible to see the same basic process operating in each case. For example, developing a new consumer product will involve picking up signals about potential needs and new technological possibilities, developing a strategic concept, coming up with options and then working those up into new products which can be launched into the marketplace. In a similar fashion deciding to install a new piece of process technology also follows this pattern (Tidd et al., 2001). We will use a simplified model that entails all aforementioned, based on Tiwari (2008) who distinguishes three phases, namely (1) conception, (2) implementation, and (3) marketing, where each phase consists of several activities (see Figure 2-1), that others

regard as phases themselves. In order to accomplish a good fusion between customer needs and technology there should be a clearly stated customer needs assessment phase or task to determine clear requirements for the product to be developed (Tuominen et al., 1999). The idea-generation and concept-testing stages are often called the "fuzzy front end" of new product development (Kim & Wilemon, 2002) because they typically lack well-defined processes, reliable information, and proven decision rules (Port, 1998). This phase of NPD significantly influences the overall success of development projects (Bacon et al., 1994). In the implementation phase, an important step is the product or service design (Urban & Hauser, 1993), because the decisions made at this stage strongly bear on all subsequent phases of product development (Roozenburg & Eekels, 1995). It is therefore understandable that it constitutes the first step in the implementation phase, which is therefore also known as the design & development phase. The result of this phase is usually a prototype that can be tested, eventually by users (Shaw, 1985). A prototype is an original model constructed to include all the technical characteristics and performances of the new product (Tiwari, 2008). The design, construction and testing of prototypes normally falls within the scope of R&D.



**Figure 2-1: A simplified approach of the innovation process (Tiwari, 2008)**

In order to improve the success of innovations organizations should apply a systematic and formal management approach to NSD (de Brentani, 1986; John & Storey, 1998; Storey & Easingwood, 1996). Alam and Perry (2002) review the literature on process models for service innovations, and come to the conclusion that, contrary to product innovation models, prescriptive models for service development are scarce. They and Alam (Alam, 2002) introduce a 10-stage model that is very similar to the conceptual model of product innovation. These stages are in sequence (1) strategic planning, (2) idea generation, (3) idea screening, (4) business analysis, (5) formation of a cross-functional team, (6) service and process design, (7) personnel training, (8) service testing and pilot run, (9) test marketing<sup>4</sup>, and (10) commercialization. John and Storey (John & Storey, 1998) review existing literature on NSD and observe that product

<sup>4</sup> Test marketing has two primary functions. The first is to gain information and experience with the marketing program before making a total commitment to it. The second is to predict the program's outcome when it is applied to the total market (Aaker et al., 2000).

screening, concept testing, product testing and market testing techniques – typically, activities that involve (potential customers) – have found to be little used in NSD, e.g. Easingwood (1986) who found that small companies rely more on ideas from customers than large ones. Where they are carried out, they are done less proficiently, even though they are considered to have a high impact on the outcome (Reidenbach & Moak, 1986). The innovation process for services may appear different because services are often less tangible – but the same underlying model applies (Akamavi, 2005; Tidd et al., 2001) and the innovation concept and the innovation theories from manufacturing studies may be applied to services as well (de Brentani, 1991; Gadrey et al., 1993; Meyer & DeTore, 1999; Sundbo, 1997). However, in comparison to tangible goods, the specific characteristics of services make the development of new service products more complex. Therefore, when designing and developing a new service product, an iterative process is recommended, rather than the linear process, often advocated for tangible products (Alam & Perry, 2002). Another typical difference with the service innovation process is that the time required to develop industrial products is far greater than that associated with services. In some sectors, such as the FS industry, NSD may take weeks as opposed to years in NPD (Akamavi, 2005). Voss and Zomerdijs (2007) show, however, that practice has gone beyond the application of product innovation principles and methods in service innovations by the use of the *customer journey* approach. In this approach the service starts long before the actual transaction and ends long after the transaction is completed, and consists of multiple components, multiple touch points and moments of truth (Emberton & Stanley, 2008). The journey approach has its origins in the work on service blueprinting and service mapping by Shostack (1984), Kingman-Brundage (1992) and Bitner (1993).

In a comparison study for B2B and B2C firms, it was found that while there were many similarities between the structure and the processes undertaken by B2B and B2C firms, some difference did exist (Hanna et al., 1995). B2B firms tend to organize more along cross-functional lines; place a heavier emphasis on customers as sources of ideas; and place heavier emphasis on finding new uses/markets for their products, B2C firms on the other hand, tend to make more use of product management/development groups; accord more decision-making authority to the marketing department; and focus more on totally new products and line extensions than do B2B-companies. However, whether it be a consumer or business product being developed, the same fundamental marketing principles appear apply (Hanna et al., 1995).

#### ***2.7.4 Conclusive remarks regarding the innovation process model***

We can conclude this section that the contemporary innovation process consists of a certain number of phases, with in between stage gates where it is decided upon whether to continue. The number of phases differs between existing process models, but the process is in almost all cases a linkage between a new idea, the design and development of the innovation, including the concept testing and its subsequent commercial exploitation. We will use the simplified process approach (depicted in Figure 2-1) that consists of three main phases. The first of the three phases in the chain is to conceive the innovation by generating and selecting ideas; this can happen inside a unit, across units in a company, or outside the firm. The second phase is to convert ideas, or, more specifically, developing them into products or practices. The third is to diffuse those products and practices. In accordance with Rothwell and Gardiner (1985), Rothwell (1986) and Shaw (1985) we will add a fourth phase called *re-innovation*, a phase distinguished and followed during the use of the initial or primary innovation, where product performance is improved during interaction with users (Gardiner & Rothwell, 1985; Shaw, 1985). In this phase we can distinguish activities like customer training, customer service, warranty and complaints handling, and maintenance or replenishment. An interesting aspect of this scheme is the suggestion that the innovation does not cease at market launch, but rather continues via a process of evolutionary development,



refinements and improvements during the use of the innovation (Garcia & Calantone, 2002). A study by Lawton and Parasuraman (1980) in both industrial and consumer goods, for instance, revealed that almost 15% of all innovation projects of firms is stimulated by users' complaints and suggestions. Similarly, Utterback et al. (1976) found that a higher level of consumer activities was found for consumer electronics, where about 32% of the analyzed manufacturers' innovations were initiated by detailed requests. Feedback from customers is important because it increases the value of existing products and expands their life-cycle (Treacy & Wiersema, 1995).

## **2.8 Innovation process tools**

### ***2.8.1 General NPD and NSD tools***

A large number of models and methods have been introduced to improve a company's performance of new product development, but research showed that awareness and use of them seem to be low (Mahajan & Wind, 1992; Nijssen & Frambach, 2000; Nijssen & Lieshout, 1995). It seems that this use is dependant of certain organizational factors. Companies with a more elaborate NPD process, more departments involved in their NPD process, a higher level of interdepartmental communication, and which are involved in turning out new products, all make more use of NPD tools and techniques (Nijssen & Frambach, 2000).

Tidd and Bodley (2002) also report on a review of the range of formal tools and techniques available to support the new product development process, and examine the use and usefulness of these by means of a survey of 50 projects in 25 firms. They identified the effect of project novelty on the frequency of use and perceived usefulness of a range of tools and methods. According to Nijssen and Frambach (2000), the type of tools and techniques to adopt will depend on the nature and content of a company's NPD strategy. A company aiming at developing new-to-the-world products should focus on upstream techniques, such as idea generation techniques, whereas a company that is pursuing a fast follower strategy will benefit more from, for instance, product optimizing techniques. Further, a company will generally not select one or two tools but use a selection of complementary tools. In terms of usefulness, focus groups, partnering customers and lead users and prototyping were all considered to be more effective for high-novelty projects, and segmentation least useful (Tidd & Bodley, 2002). However, Lynn et al. (1996) exhibit that such methods – focus groups, customer interviews, lead user approach and conjoint analysis – all showed away from what proved to be the most significant market opportunities for discontinuous innovations. Cross-functional development teams were commonplace for all types of project, but were significantly more effective for high-novelty cases. In addition, many tools rated as useful were not commonly used, and conversely some tools in common use were considered to have low levels of usefulness (Tidd & Bodley, 2002). Dahan and Hauser (2001) provide an overview of the state of the art in research that addresses the new challenges for the marketing community regarding product development. Holt (1987) provided an overview of methods for the systematic assessment of user needs in NPD project, i.e. techniques that fit in the front end of the innovation and qualified them on several aspects like their ability to elicit rational, emotional, existing and future needs, and their suitability for industrial or consumer industries. Finally, Rochford (1991) gives us an overview of over 30 idea generation techniques of which brainstorming is just one. Although his research is dated, it shows that techniques where an active participation of the user is expected, e.g. user observation, user employment, cooperation of projects with users, are particularly recommended to elicit emotional and future needs as well. And, as we will discuss in the next sub-section, this is imperative for the success of innovations.

Moritz (2005) has catalogued the tools for service design. The tools are drawn from all kind of disciplines, like social anthropology, linguistics, market research, organizational design, and quality management approaches like process management, customer experience and voice of the customer. See Table 2-5.

Tools and methods have also been developed to achieve specific objectives in the innovation. For example, to reduce NPD cycle time effectively, Millson et al. (1992) have formed five generic NPD acceleration approaches by clustering similar methods and techniques and proposing an order of implementation. One of these generic approaches aims at eliminating unnecessary activities in the NPD process, e.g. by involving “lead users”. A survey of Dutch companies (Nijssen et al., 1995) found that the proposed hierarchy of techniques has a positive effect on NPD speed. The survey results also suggest that faster NPD is possible through the use of the various acceleration methods without regard for the order in which they are implemented. Langerak et al. (1999) built further on Millson et al’s findings by investigating additional objectives to these approaches and come to the conclusion that there is a hierarchy of objectives in these approaches, in which lead user analysis also facilitates needs assessment, in addition to cycle steps reduction.

Service Design Activity	Tools
Understanding, assessing needs	Benchmarking Critical Incident Technique Ecology Map Ethnographical studies Shadowing Trend Scouting
Thinking (framing)	Affinity Diagram Fishbone Diagram Touch point Analysis
Generating (exploring)	Body-storming Randomizer Unfocus Group
Filtering (reducing)	Heuristic Evaluation Personas Pluralistic Walkthrough
Explaining (rationalizing)	Experience Prototyping Metaphors Social Network Mapping
Realizing (building)	Blueprint Role Script

**Table 2-5: Service Design Tools, adapted from Moritz, 2005**

### ***2.8.2 Tools to be used in specific process stages or activities***

#### **Conception Phase**

##### ***Needs assessment***

In order to accomplish a good fusion between customer needs and technology there should be a clearly stated customer needs assessment phase or task to determine clear requirements for the product to be developed (Tuominen et al., 1999). Recognizing the iterative nature of the fuzzy front end, Dahan and Hauser (2001) review techniques for gathering raw data on customer needs. These methods include direct survey methods with which marketing researchers are familiar – i.e. surveys and interviews (focus groups and one-to-one interviews), but include as well Kano’s model of delighting customers (Walden et al., 1993), the concept of disruptive technologies (Christensen & Bower, 1996), empathic design and user observations (Leonard & Rayport, 1997), methods to

get at underlying meanings and values (Zaltman, 1997), Kansei analysis<sup>5</sup> (Childs et al., 2002), methods for the “mind of the market” (Zaltman, 2003), “lead user analysis” (Langerak et al., 1999) and benefit chains (Gutman, 1982). They then review methods for characterizing and refining customer needs based on apparent patterns and themes, for organizing needs and identifying market segments. Needs must be prioritized and many marketing methods are quite effective. In the fuzzy front end they propagate the use of the simpler and less costly methods recognizing that any information will be refined in the design and prototype phases. Discussed are the Affinity Diagrams or K-J Analysis (Mizuno, 1988), Voice-of-the Customer (Griffin & Hauser, 1993).

Quality function deployment (QFD) is described as a system to assure that customer needs drive the product design and production process. Customers are interviewed through qualitative research to assess the customer needs – descriptions in the customer’s own words of the benefit to be fulfilled by the product or service. In a typical study between 20 and 30 customers are interviewed for approximately one hour in a one-on-one setting. Interviewers might probe for higher-level needs or for detailed elaborations as in the laddering and means-end techniques (Gutman, 1982; Reynolds & Gutman, 1988). Other potential techniques include benefit chains (Morgan, 1984), repertory grids (Kelly, 1963), the outcome based approach (Ulwick, 2002; Ulwick & Bettencourt, 2007; Ulwick et al., 2007) and the Zaltman Metaphor Elicitation Technique (Zaltman & Coulter, 1995). While many applications use one-on-one interviews, several of these techniques can be used with focus groups (Calder, 1977) and min-groups of 2 to 3 groups (Griffin & Hauser, 1993). Involvement of customers themselves occurs only in the initial phase of the product design process. Feedback from customers in the latter stages is not explicitly supported (Kaulio, 1998).

Many commonly used need assessment methods have originated from statistics and market research. Harari (1994) has analyzed the problems of traditional market research and its methods, and came to the finding that many of these problems are related to producing useful information for NPD. Traditional market research mainly produces information of the present situation and it does not promote co-operation with a company and its customers effectively. A study by Griffin (1997) found that the best succeeding companies use significantly more qualitative market research tools than the rest for NPD. Mahajan and Wind (1992) have studied the use of NPD need assessment methods in the Fortune 500 firms. Twenty-four different models and methods were cited, of which the focus groups was by far the most often used. Focus groups were cited being used for all NPD-activities, except for business and financial analysis, product development, pre-market volume forecasting and market tests. QFD was the eighth.

In case of radical innovations or really novel products, the innovative product development process obviously has no preceding products available to start the first step with. However, its starting point should still be consumer needs, desires and aspirations—what delights them and what not—in some way. Different means could be applied to gather this type of input. The process could start with *contextual research* (Beyer & Holzblatt, 1998), i.e. determining the target group, and investigating drives, needs, experiences, habits, and practices of the target group. The goal of this contextual research is to use this collected background information on the target group, as inspiration and triggers for idea generation. Methods and techniques that can be applied

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<sup>5</sup> Kansei Engineering : The idea behind the method is to understand the user’s emotional needs as opposed to functional needs in order to design a product that reflects what the user really wants and sometimes cannot articulate clearly the method creates a common vocabulary to ease the collaboration between specialists from different fields from marketing, engineering, industrial design, psychology, etc.

in this contextual research are observations 'in the field', interviews, but also more 'alternative' approaches such as cultural probes and bodystorming. *Cultural probes* are basically packages of mixed media materials, such as disposable cameras, diaries, photo albums, postcards and tape recorders that are given to participants to use and complete in their daily environments. They consist of materials and tasks that have been carefully constructed by the researchers to allow participants to document and record elements of their daily lives and thoughts that reflect the themes of the project involved. They are design-oriented tools that are typically based on self-reporting by the participants (Mattelmäki, 2008). Cultural probes are meant to be used in an exploratory way: probes are aiming to inspire rather than to collect facts, and the use of probes is geared towards design generation, rather than problem solution. Given the rather individualized and fragmentary nature of the data that can be collected with cultural probes, they are often combined with other methods such as interviews or participant observation (Hoonhout, 2007; Mattelmäki, 2008). A method called *bodystorming* is meant for carrying out design sessions in the original context, 'in the wild', instead of the office. A location is selected that is identical or similar to the original environment. Innovation, carried out on-site, is based on ethnographical data presented as concrete design questions. Individual solutions to design questions are brainstormed and discussed on-site. Facets of data collection and preparation, formulation of design questions, selection of locations, session administration, and evaluation of design ideas are presented. Bodystorming permits immediate feedback for generated design ideas, can provide a more accurate understanding of contextual factors, and is best suitable for designing for activities that are accessible and unfamiliar to the researchers (Oulasvirta et al., 2003).

Ulwick and Bettencourt (2007) assert that a customer need is not the same as a product requirement. A need must reflect the customer's own definition of value, from his perspective. Customers interpret a product in its unique context of use. The context of use consists of the task they want to use it for, the location of use, the instructions they receive, and the available technical support (Patterson, 2002). Customers therefore typically think in jobs that have to be done (Ulwick et al., 2007), therefore the need must leave from the job the customer wants to be done and refrain from mentioning technology, solution or product/service features. But, arguing over which method to capture customer needs is best, is unnecessary; it is knowing what inputs you are looking for that is critical for success (Ulwick & Bettencourt, 2007).

### ***Ideation***

Once the PD team has identified and grouped customer needs it must generate ideas on how to address those needs. Dahan and Hauser (2001) review some of the more common methods of ideation. A wide variety of ideation methods have been proposed including brainstorming (Arnold, 1962; Osborn, 1963), morphological analysis (Ayres, 1969), group sessions (Prince, 1970), forced relationships (Osborn, 1963), systems approaches (Campbell, 1985), varied perspectives (de Bono, 1985;1995), archival analysis or TRIZ (Altschuler, 1985;1996), and inventive templates (Goldenberg et al., 1999). Typically, these techniques are all aimed at ideation by the NPD-team, and assume procedural knowledge by this team; the techniques do not provide procedures to include customers.

Brainstorming is a group creativity technique designed to generate a large number of ideas for the solution to a problem. The method was first popularized in the late 1930s by Alex Faickney Osborn (Osborn, 1963), an advertising executive and one of the founders of BBDO – a worldwide advertising agency network – in a book called *Applied Imagination*. Osborn proposed that groups could double their creative output by using the method of brainstorming. Although brainstorming has become a popular group technique, researchers have generally failed to find evidence of its effectiveness for enhancing either quantity or quality of ideas generated. Because of such problems as

distraction, social loafing, evaluation apprehension, and production blocking, brainstorming groups are little more effective than other types of groups, and they are actually less effective than individuals working independently (Diehl & Stroebe, 1991; Nijstad et al., 2003). For this reason, there have been numerous attempts to improve brainstorming or replace it with more effective variations of the basic technique. Although traditional brainstorming may not increase the productivity of groups, it has other potential benefits, such as enhancing the enjoyment of group work and improving morale. It may also serve as a useful exercise for team building.

## **Implementation**

Dahan and Hauser (2001) address concept selection and the design and engineering processes that develop concepts into viable products with reviews of methods such as lead user analysis (Urban & von Hippel, 1988), Kaizen and Teian analysis (Imai, 1990), set-based design (Sobek et al., 1999), Pugh concept selection (Pugh et al., 1996), Value Engineering (Ulrich & Eppinger, 2000), Quality Function Deployment (Griffin, 1992), Conjoint Analysis (Moore et al., 1999). Each of these methods builds on the customer-needs identification and ideation that took place during the fuzzy front end of product development.

Consumer Idealized Design involves customers in the early phases of the product design process, where they are invited to generate requirements and make a new design of a product. Customers actively find new solutions to their problems and requirements (Ciccantelli & Magidson, 1993; Kaulio, 1998). User oriented product development involves the user in the beginning to develop user requirements (Kaulio, 1998). *Design games* (Brandt et al., 2008) are recommended as a way for formatting design dialogues with users.

After the product concepts have been generated, winnowed and refined, they need to be tested before they can be launched. The goal in this phase of the PD process is to evaluate the concepts (and engineer the final product) so that any launch is highly likely to succeed. The team must make tradeoffs among the cost of testing, the advantage of further development, and any delays in product launch. A testing method should be accurate and cost effective (Dahan & Hauser, 2001). Methods reviewed by Dahan and Hauser (2001) include Rapid Prototyping (Thomke & Reinertsen, 1998), Parallel Concept Testing (Srinivasan et al., 1997), Internet-Based Rapid Concept testing (Dahan & Srinivasan, 2000), Information Acceleration (Urban et al., 1997). Concept testing involves customers in the concept evaluation phase. The concept is something that is made in a phase before prototypes are made. It is recommended to supplement the concept test with a prototype test, like beta testing (Dolan & Matthews, 1993; Kaulio, 1998). Beta testing aims to determine if the product does what it is designed to do in the customer or user environment. Since beta testing is a field test, comments have to be collected through observations or in retrospective studies (Kaulio, 1998). The user-oriented product development also involves the user in later field tests of several prototypes (Kaulio, 1998).

## **Tools for launch and marketing**

In a very recent article Davenport and Harris (2009b) report about the use of technology to recommend and predict what consumers will buy and use. They describe several tools in Davenport and Harris (2009a). The tools described are: Biological response analysis, Cluster analysis, Attributed Bayesian analysis, Content-based filtering/decision trees, Neural network analysis, Collaborative filtering (most used, but not appropriate for new goods), Prediction Markets, Regression analysis, Social network based recommendation, and Textual analysis. They observe that an important problem with these predicting tools is that most need a large number of data (participants) to succeed. Also, they need to monitor changing dynamic market conditions, like needs, in order to identify emerging

trends. Many cases, recommendations can be made only after the product was created, not before! So, tools are not perfect and systems are also not infallible: decisions by the firm still have to be made. However, all of these tools do not incorporate customers' participation, except for being a passive respondent in providing the data for the necessary prediction.

There are other tools for prediction that do include consumers in the forecasting, usually applied in previous phases of the innovation process. These are consumer surveys, concept testing, conjoint measurement, focus groups, consumer interviews, test markets, simulations with consumers, experiments. With these we can find out if consumers have problems with the current product, their preferences for a specific product, their actual behavior in usage situations, and such. To make valid conclusions, it is necessary for consumers to understand the product, its main attributes, its consequences in use and that they are aware of all alternative products (Langley et al., 2005). The techniques are not applicable when the innovation requires significant behavioral changes, when the consumer cannot understand the product or its likely impact on their daily lives. If this is true, consumers are unlikely to be able to predict adoption of really novel products, or innovations, in which process they have not participated, and therefore are confronted with it the first time during this test. However, if consumers or customers have been involved in early stages of the process we expect them to assess new products' benefits and utilities better.

### **Re-innovation tools**

As has been discussed previously, the re-innovation stage is not a universally recognized stage in the innovation process. It is therefore expected that no explicit tools for this stage have been identified and defined, yet. However, we have also reviewed that this stage is mainly about the establishment of a dialogue between the company and its customers on the use of the innovation, its shortcomings, possible improvements, additional needs, customer satisfaction, and customer experience. Typical methods or techniques that can be used are customer visits, complaints and suggestion box, satisfaction surveys, and other feedback techniques. We have also seen that most of these feedback techniques can be created online, by using modern interactive techniques like customer forums, blogs, wikis, and (mass customization) product configurators.

## **2.9 Innovation success: market or technology orientation**

Many successful inventions fail to become successful innovations, even when well planned (Bessant, 1993; Henderson & Clark, 1990; Lilien & Yoon, 1989; Robertson, 1974). Equally, innovation alone may not always lead to business success (Lawton & Parasuraman, 1980). Although there is strong evidence to connect innovation with performance, success depends on other factors as well (Tidd et al., 2001). Success in innovation appears to depend upon two key ingredients – technical resources (people, equipment, knowledge, money, etc.) and the capabilities in the organization to manage them (Tidd et al., 2001). But, scholarly discussion also postulates that innovation success – or even, the ability to produce innovations – is highly dependent on the strategy focus of firm: technology or innovation orientation versus marketing orientation.

### ***2.9.1 Defining technology orientation and marketing orientation***

An innovation or technology philosophy asserts that customers will prefer those products and services that provide the greatest quality, performance and features. Managers in firms that enact a technology philosophy devote their energy towards innovation – that is inventing and refining superior products, services and communications. In contrast a marketing philosophy contends that identifying the needs and wants of the target market, and delivering products and services that satisfy these is key to the attainment

of organizational goals. Managers in firms that enact a marketing philosophy apply their efforts to listening to, and reacting to customers – that is, the needs and wants of customers are the main focus of the firm's endeavors (Berthon et al., 2004). Slater and Narver (1995) define market philosophy or orientation as an implementation of the marketing concept, that entails learning about customer needs, the influence of technology, competition, and other environmental forces, and acting on that knowledge in order to become competitive. The marketing concept requires that customer satisfaction rather than profit maximization be the goal of an organization (Aaker et al., 2000). Based on extensive field interviews with managers and executives, Kohli and Jaworski (1990) categorized the activities to implement a marketing concept into three groups: (1) organization wide collection of market information, (2) dissemination of the information among functions, and (3) organizational responsiveness to such information. These activities are posited to be prerequisites if the organization is to create superior products and services that respond to customer needs. Narver and Slater (1990) suggest that the market orientation of an organization involves three behavioral components of customer orientation<sup>6</sup> – perceived as the most important one in innovation sense (Han et al., 1998; Lawton & Parasuraman, 1980), competitor orientation and inter-functional coordination, and two decision criteria-long term focus and profitability. Deshpandé et al. (1993) discussed that market orientation is in essence a customer orientation embedded in corporate culture.

### ***2.9.2 Innovation success requires a market orientation***

A central feature of most studies of the industrial innovation process is their emphasis on the role of demand specification in determining success, i.e. the necessity for product characteristics to match the 'user needs' profile (Rothwell, 1977) or 'need satisfaction' (Rothwell et al., 1974). In defining innovation we've also seen that it is the market that determines whether something new is an innovation, or not (Tuomi, 2002). Statements such as "75% of successful innovations rise in response to the recognition of a need" are common, which is interpreted as an argument in favor of a 'market' rather than an 'R&D' bias in would-be innovative firms. Therefore, several scholars argue that a potential benefit of market orientation is that the firm is more likely to develop innovations that are compatible with the needs of customers. Customers may have more knowledge about their needs and a better understanding of relevant product or service requirements than the firm (Salomo et al., 2003). This finding suggests that market orientation helps to reduce the chances of the firm producing innovations that require major behavioral changes on the part of potential customers for adoption. Because market orientation reduces the degree of incompatibility of the new product with customer needs, it is likely to enhance speedy adoption and success of innovations (Cooper, 1979a; Cooper & Kleinschmidt, 1987). Morgan et al. (1998) show that firms with high market orientation possess a greater organizational learning capability. Hurley and Hunt (1998) propose that market and learning orientation are antecedents to innovativeness. Han et al. (1998) show that market orientation, particularly the component customer orientation, facilitates organizations' innovativeness, which in turn, positively influences performance. Therefore, scholars suggest that market orientation leads to successful innovation and higher organizational performance (de Brentani, 1993; Deshpande et al., 1993; Han et al., 1998; Kohli & Jaworski, 1990; Webster, 1988). A strong market orientation is also consistent with cycle time reduction (Cooper & Kleinschmidt, 1994).

The product and service development literature also emphasizes the importance of market orientation (Alam & Perry, 2002; Atuahene-Gima, 1996b; de Brentani, 1995;

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<sup>6</sup> Customer orientation is defined as the sufficient understanding of one's target buyers to be able to create superior value for them (Narver & Slater, 1990).

Johne & Storey, 1998; Montoya-Weiss & Calantone, 1994; Salomo et al., 2003). Research shows that a strong market focus and an effective marketing department are important correlates of powerful innovation performance (Doyle, 1998). To successfully innovate, companies can spend the most money, hire the best engineers, develop the best technology, and conduct the best market research. But unless their research and development efforts are driven by a thorough understanding of what their customers want, their performance may well fall short — at least compared to that of their more customer-driven competitors (Jaruzelski & Dehoff, 2007). Huizenga (2001) reports that about 30 to 40% of the innovation's success is determined by listening to the customers. Cooper (1999) asserted that despite 25 years of research into why new products fail, product developers have not learned their lessons and continue to make the same mistakes in NPD that lead to failure. One such mistake is that the Voice of the Customer (VOC) is still missing in new products. A study by Cooper et al. (1994) revealed that market research is the missing ingredient in many financial services firms. Malhotra et al. (1996) recall that the customer is missing in 30 to 40% of the NPD cases, including the financial services. A study in financial services by (Athanasopoulou & John, 2004) shows that the highly successful group follows the problem find-solve approach (Rochford, 1991), where products are developed based on identified market needs and a formal screening process. John and Pavlidis (1996) researched the corporate banking market and found that in initiation activities there is strong evidence that leader banks adopt a predominantly market-based approach to identifying product innovation opportunities. They pursue initiation strategies that involve selecting markets on the basis of benefits sought by actual and potential clients. Barraba and Zaltman (1991) have expressed the issue well by stressing that such companies "listen first to the voice of the market" and only thereafter "to the voice of the company".

### ***2.9.3 The discussion: either market or technology orientation***

The relationship between market orientation and innovation is, however, a subject of debate. Several conceptual writings suggest that the adoption of the marketing concept philosophy stifles the development and marketing of original new products, and rather encourages the development of product modifications (Bennett & Cooper, 1981). For example, Hayes and Abernathy (1980) assert that market-driven strategies aimed at satisfying customers and reducing risk in the innovation process lead to less superior products in the long run. Atuahene-Gima (1996b) found that market orientation has a significant negative impact on product newness to customers in the combined sample and product sample. The rationale behind this argument is that customers are unable to articulate their future needs beyond current consumption experiences. Therefore the adoption of the marketing concept, with its emphasis on customers as sources of new product ideas, is unlikely to lead to breakthrough innovations (Deszca et al., 1999). However, an empirical study by Lawton (1980) found that the adoption of the marketing concept had insignificant effect on innovation activities such as the use of customer-oriented sources of new product ideas and utilization of market research in idea generation and commercialization. Further, they found that it has insignificant influence on the degree of product newness, measured from both the firm and customer's perspectives.

A number of researchers, as we have seen, argue the possibility that market orientation contributes to organizational performance through the new products it helps bring to market (Deshpande et al., 1993; Gatignon & Xuereb, 1997). In fact, ensuring organizational prosperity can be considered the ultimate goal of new product development efforts (Li & Calantone, 1998; Wheelwright & Clark, 1992a). Therefore, of research interest for some time, has been whether market orientation affects product innovativeness, i.e., the degree of a product's newness. Salomo et al.'s (2003) findings suggests that market orientation helps to reduce the chances of the firm producing innovations that require major behavioral changes on the part of potential customers for



adoption, however, product newness to customers is significantly and negatively related to market success in all the samples. With an increasing degree of innovativeness, potential customers are increasingly unable to articulate their needs and preferences in sufficient detail (Leonard, 2002). As a consequence, market related risk increases, which again demands stronger customer or market orientation in order to cope with these critical resources (Salomo et al., 2003). Market orientation is more strongly related to NPD performance when the product is an incremental one rather than a substantial innovation (Atuahene-Gima, 1995). These findings appear to contradict assertions that increased product newness enhances innovation performance (Bennett & Cooper, 1981). However, they reinforce the view that innovation success is contingent upon knowledge about customer needs and development of innovations closely related to the current resources of the firm (Cooper, 1979a; Hayes, 1985).

The links between market orientation and the degree of product innovation are far from being fully explained (Gatignon & Xuereb, 1997; Lukas & Ferrell, 2000; Zhou et al., 2005). The relationship between the three components of Narver's and Slater's (1990) conceptualization of market orientation and the development of innovative products, in particular, meets very mixed findings and arguments in the literature (e.g., (Atuahene-Gima, 1996b; Christensen & Bower, 1996; Gatignon & Xuereb, 1997; Lukas & Ferrell, 2000; Macdonald, 1995; Slater & Narver, 1994). For instance, Macdonald argues that getting close to a small number of the customer-base will reduce the amount of ideas coming from the customers, discouraging innovation. Consequently, Zhou et al. (2005:43) have recently argued that "the central issue of whether market orientation facilitates or impedes breakthrough innovation remains unanswered". The findings extend to what is appreciated about a firm's overall performance in the field of product innovation, the idea that a customer orientation is important to fuel overall new-to-the-world product innovation. The conditional effect obtained in this study for customer orientation concurs with Lukas and Ferrell (2000). Li and Calantone (1998) also observe that customer knowledge<sup>7</sup> is related with new product advantage. However, these results run against findings and arguments that customer orientation may restrain product innovativeness (Christensen, 1997; Christensen & Bower, 1996; Gatignon & Xuereb, 1997). Augusto and Coelho (2009) also investigate the effects of market orientation in new-to-the world product innovation, but unlike other studies, they also examine how other variables like innovativeness and competitive strength interplay with market orientation to affect product development. Their finding, however, goes against some contentions in extant literature indicating that a competitor focus can lead to the development of me-too, rather than breakthrough, products. In fact, their finding apparently collides with that of Lukas and Ferrell (2000), who observed that competitor orientation negatively affects the introduction of new-to-the-world products. Authors explain this discrepancy by stating that Lukas and Ferrell have only considered the three components of market orientation, whereas they have considered additional explanatory variables, and several moderating effects. Notwithstanding, their approach accommodates the finding from Lukas and Ferrell, as it shows that, under certain circumstances, competitor orientation may have a detrimental effect on product innovation. Their results indicate that firm innovativeness and competitive strength are pure moderators.

#### ***2.9.4 Both market and technology orientation as prerequisites for success***

Berthon et al. (1999) argue that market orientation and innovation orientation are two distinct constructs which can interact in a facilitative or inhibitory fashion. In reality,

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<sup>7</sup> Customer knowledge entails knowing what customers need and want.

there is no necessary conflict between the two. The distinction lies in the fact that in order to *serve* customers (market orientation) a firm should first need to *create* customers (innovation orientation). Over the longer term, innovation is a prerequisite for creating customers, a quite different process from attracting customers who already exist (marketing) (Berthon et al., 1999). Market or customer orientation alone is insufficient to ensure long-term prosperity (Deshpande et al., 1993). If innovation is only seen as meeting customer needs, the result can be a lack of technical progression, leading to inability to gain competitive edge and little internal learning or development of technological competence (Tidd et al., 2001). Mowery and Rosenberg (1979) conclude by postulating that, rather than viewing either the existence of a market demand or the existence of a technological opportunity as each representing a sufficient condition for innovation to occur, one should consider them each as necessary, but not sufficient, for innovation to result; both must exist simultaneously. Following the marketing concept alone is disastrous for the longer term (Bennett & Cooper, 1979). Rothwell and Gardiner (1985) confirm this viewpoint - it is those firms that attain a reasonable balance of functions, as well as good communication and coordination between them, which enjoy the greatest likelihood of success. Tushman and O'Reilly (1996) that found that for longer-term prosperity, the firm must not only meet the needs and wants of today's customers, but must simultaneously innovate to ensure the creation of new customers and the means of satisfying their future needs and wants - a process they term *organizational ambidexterity*. Gatignon and Xuereb (1997) mitigate this by postulating that a synthesis of technological and customer orientation is well suited to markets where uncertainty is high. At this stage we also refer to the studies of von Hippel (1988), who showed that the source of innovations lies in companies and markets as well. In the controversy of what he names the Manufacturer Active Paradigm, comparable with the technology push vision, against the User Active Paradigm, which is the market pull approach, he argues that a substantial portion of innovations comes from users, but that these users need some basic product or platform which they can modify and change, confirming the idea that both firms and markets can initiate innovations.

### ***2.9.5 Or is it a little more of this than the other?***

As we can see by the previous review, the relationship between marketing and innovation has often been uneasy. The potential for friction between those who see the customer as the source of all wisdom, and those who see technological innovation as the key driver of economic growth is very evident. In the previous sub-section it is suggested that companies should strive for both a market and a technology orientation. But how they relate to each other?

A study by Soderquist et al. (1997) showed that the most relevant sources of innovation for SMEs are (1) demands placed on business by customers, (2) close working relationships with a key customer, and (3) input from their own R&D department. According to Berry (1996), if SMEs need to be successful and even survive in the long term, they must be more market-driven rather than technology-driven. In other words, SMEs must assign R&D the task of producing innovations that meet specific marketing objectives and opportunities identified by customers/clients, rather than considering customer needs and wants as residual and addressing them only after the R&D breakthrough is made (Soderquist et al., 1997). Companies more focused on customer insight or market needs are also more successful than their less-customer-focused peers. In particular, companies that directly engaged their customer base had twice the return on assets and triple the growth in operating income of the other survey respondents (Jaruzelski & Dehoff, 2007).

The theory of disruptive innovations (Christensen, 1997; Christensen & Bower, 1996; Christensen & Raynor, 2003) suggests that being customer oriented is a disadvantage concerning the abilities of a firm to reach disruptive innovations. According to Danneels

(2004) Christensen is misinterpreted concerning the issue of listening to customers. The stance that Christensen takes does not mean that companies should not be customer-oriented, because customer orientation is not directed at current customers only, but also on future customers (Danneels, 2003), and that Christensen's portrayed firms had a shallow understanding of customer needs. Chandy and Tellis (1998) found that companies focusing on future customers had a greater degree of radical innovation than companies that focused on their existing customers. Being market oriented does not necessarily imply the negligence of disruptive or radical innovation opportunities (Danneels, 2004).

Although the literature is unambiguously supportive of adequate market research as a success factor, one prevailing instrument — involving consumers into the innovation process — remains controversial. One argument favoring customer involvement stems from the volatility of customer needs which requires an adequate study of these needs (Calantone et al., 1993; Wind & Mahajan, 1988). Moreover, the majority of successful ideas originate within the market, not within the firm (Johne & Snelson, 1988; Maidique & Zirger, 1984). These arguments are empirically ascertained: three out of four innovators value customer involvement; half the innovators consider it as a prerequisite for success (van der Panne et al., 2003). Innovators involving customers obtain significantly higher success rates (Gemünden et al., 1992).

An argument opposing customer involvement is the pitfall of becoming prejudiced about customer's needs as the innovator involves customers more regularly (Maidique & Zirger, 1984). Customer involvement may bias innovators towards imitative innovations, as customers express their preferences in terms of products they are already familiar with. Customers may hardly envision their future preferences, and may not express them adequately. In fact, customer involvement may undermine the innovator's creativity and may lead to a neglect of technology driven ideas. Ideas should be allowed to evolve in the firm's R&D department, and should subsequently be integrated them with the firm's marketing strategy. This can induce equilibrium between technology-push and need-pull factors (Johne & Snelson, 1988; Rackham, 1998).

We can conclude this section with the observation that there is no real clear driver for innovations and that both technology development as market demand attribute to innovations. Obviously an innovating firm will need to find a balance between technology-push and need-pull factors (van der Panne et al., 2003). However, it is also obvious that market demand, i.e. needs and goals of users, determine the development of new technology as well. This conclusion is supported by survey findings among the most innovative firms (Jaruzelski & Dehoff, 2007).

## **2.10 Conclusion to this chapter**

In this chapter we have reviewed the general innovation theory in order to draw the boundaries for our research regarding customer co-creation. We have defined innovation, discussed the possible objects and novelty of the innovation, reviewed the concept of Open Innovation, described the evolution in the innovation process model, reviewed tools and techniques used in innovations and, finally, reviewed the theory in respect of the determinants of the success of innovations. As for the innovation process we have determined that it can be represented by a universal process model consisting of four main phases. In this review we have observed several clues indicating the conditions, possibilities and benefits to involve customers in the company's innovation process. We observe, for example, that 'listening to the customer' – i.e. in the front end – can lead to an increase of the innovation's success, but also that involving them in later stages of the process can be beneficial to the overall success of the innovation. However, this general theory assumes a rather passive customer and does not prescribe in any way how to

actively involve the customers into co-creation. These insights are also somewhat outdated. As observed in our introduction to this research (Chapter 1) we have observed that contemporary technological and societal developments have transformed the customer from a passive recipient of market research and product testing probes to an active and empowered contributor to firms' processes. We have therefore observed that the subject of an active customer involvement in NPD and NSD is gaining in interest from researchers. However, as most organizational research the nature of this research is mainly descriptive, while practice is practically screaming for guidelines, suggestions and procedures to harness the contemporary potential in their customers. Because of this omission, we conducted this research to find out which guidelines companies need to consider when co-creating with their customers in the innovation process, in large part by using the extant literature on the subject. In the next chapter we will describe our research method to come to the answers to the mentioned questions.

# Chapter 3 Research Design and Methodology

## 3.1 Introduction to chapter 3

In this chapter the aim is to answer the previously stated questions (see 0): How can we design and test a protocol with which management can effectively involve their customers into co-creating in their innovation projects? As the objective is to design and to test, this research follows a design based research (DBR) approach, where we will follow van Aken (2004; 2005; 2007) in what is named Design Science. This chapter elaborates on the main characteristics of this relatively new research approach and describes the methodology used in this research. We will therefore first define the term 'design', and continue to elaborate on the Design Science approach, by describing its characteristics, procedures, the testing and the outcomes (3.2). After completion of this Design Science description, we will continue by describing the way we use the Design Science principles in our research design (0 through 3.6).

One of the important findings and conclusions, related to the Design Science approach, will be that, in order to make a valid and grounded design, it is important to study what present theory is saying about the design subject. It is therefore that the next chapter will contain a comprehensive selection and description of present theory on customer involvement in innovations.

## 3.2 Design Science methodology

In this section we will elaborate on aspects of Design Science: what it is, its assumptions, limitations, and such, in order to describe and explain the logic of our research approach.

### 3.2.1 A definition of design

Design is used both as a noun and a verb. The term is often tied to the various applied arts and engineering. As our research subject is about innovations in an economic and business sense, we will focus on design in the engineering sense. Design could be viewed as an activity that translates an idea into a blueprint for something useful, whether it's a car, a building, a graphic, a service or a process. The important part is the translation of the idea, though design's ability to spark the idea in the first place shouldn't be overlooked (Design Council, [www.designcouncil.org.uk](http://www.designcouncil.org.uk)). A design is therefore the result of both a creative and an analytical process (de Bono, 1998).

A design is a solution to a field problem, where it is the objective to create a better situation compared with that of the problem (Denyer et al., 2008; van Aken, 2007). In our research we intend to design a protocol as a solution for the confusion that exists in practice because of the fragmented and ambiguous literature.

### 3.2.2 Design Science

Design Science refers to an explicitly organized, rational and wholly systematic approach to design: not just the utilization of scientific knowledge of artifacts, but design also in some sense as a scientific activity itself (Cross, 1993). The purpose of the design sciences is to produce tested practical methods that are successful in solving problems (Andriessen, 2004). Design Science can be defined as:

"the body of knowledge of a particular discipline on designs and design methods."(van Aken, 2007:68)

Various terms are used to describe this type of research, including "design-oriented research" (de Sitter et al., 1997), "design research" (Romme, 2003), "design-based research" (Andriessen, 2007) and "Organization Design Science" (Jelinek et al., 2008). Despite the different denotations, they all have in common that they are driven by the desire to increase the practical relevance of research. The main difference between the different design approaches is that they are rooted in different scientific disciplines. Whereas Design-Based Research aims at increasing the practical relevance within the field of research for educational policy and practice (van den Akker et al., 2006), van Aken's Design Science approach aims at reconciling the rigor-relevance problem in management research (van Aken, 1994;2005). Design-oriented research (de Sitter et al., 1997) can be regarded as a continuous iteration between theory and practice to develop a coherent set of design principles, design rules, and design sequences for improving structures and processes in organizations. The science-based design approach (Romme, 2003; Romme & Endenburg, 2006) connects the emerging body of research to the pragmatic, action-oriented knowledge of practitioners. It is an interplay between emergent design (Garud et al., 2006) and deliberate design (van Aken, 2004). As this study is related to management sciences, we follow the approach as developed by van Aken.

Design Science is one of the three categories of scientific disciplines, based on the paradigms (Kuhn, 1962) in use within social sciences. The other two categories are (1) the formal sciences, like philosophy and mathematics, and (2) the explanatory sciences, as the major sections of social sciences. The formal sciences lack empirical research or procedures, as they are intended to build formal systems of propositions based on logic, definitions and rules. Explanatory sciences aim to describe, explain and possibly predict observable phenomena within its field. Research should lead to propositions which are accepted by the scientific forum as true on the basis of the evidence provided. The mission of a design science is to develop knowledge for the design and realization of artificial objects, i.e. to solve construction problems, to be used in the improvement of the performance of existing entities, or to realize new entities, such as engineering (van Aken, 2004). Scientists try to identify the components of existing structures, designers try to shape the components in new structures (Cross, 1993). Both kind of solutions are important for organization and management studies for these fields address both improvement and construction problems. Therefore, Design Science Research in management aims both to develop knowledge to design interventions to solve improvement problems and to design systems (coherent structures and processes) to solve construction problems (Denyer et al., 2008).

Design Science is not yet widely accepted in academia. It is quite 'young' in terms of years of existence. Sociotechnical systems design and Integral Organization Renewal (IOR) are examples of the appliance of design theory and design-oriented research in management research (de Sitter et al., 1997). Previous academic research on organization design and management focused primarily on questions of theoretical relevance (Jelinek et al., 2008). In this approach it is the goal and duty of science to describe and explain natural and social phenomena and not to try to intervene in these phenomena. Interventions are for practitioners, usually management or organizational consultants (Gummesson, 2000). But Design Science asserts that theory and practice should reinforce each other (de Sitter et al., 1997; den Hertog et al., 2009). Without theory, organizational and management practice is uninformed; without practice, organization and management theory is fruitless and obsolete. In addition, the enormous diversity in organization research and theory is merely confusing without an adequate epistemology, particularly in view of the need to connect to practice (Argyris, 1996; den Hertog et al., 2009). A design science approach can facilitate an integrative framework that acknowledges the unique role and contribution of key epistemological traditions in

organization studies, including positivism, constructivism and pragmatism (Jelinek et al., 2008).

### ***3.2.3 Characteristics of Design Science***

Design-oriented research (de Sitter et al., 1997) is concerned with investigating: (1) the problems that cause firms to redesign structures and processes; (2) design alternatives and methods comparing them; (3) the process of design: strategies, methods, and power relations; and (4) the impacts of implementation. In a similar way design science focuses on the types of solutions (the designs) for the field problems and the procedures on how to design solutions for these problems (the design methods) (van Aken, 2007). Research in the design sciences is therefore characterized by: (1) research questions aimed at solving field problems; (2) an emphasis on the production of prescriptive knowledge, linking it to interventions and systems to produce outcomes, providing the key to solve these field problems; and (3) a justification of research products largely based on pragmatic validity (do the actions based on this knowledge produce the intended outcomes?) (Denyer et al., 2008). Prescriptive knowledge has a central role in design science research and follows the logic of Bunge's (1967) technological rule (Denyer et al., 2008). For Hubka and Eder (1996) the important constituents of design science are: (1) applied knowledge from natural and human sciences; (2) theory of technical systems; (3) theory of design processes; (4) design methodology.

Other characteristics of the application of design science in knowledge-intensive designing (like in engineering, medicine, and law) include the following: (1) a focus on establishing the right specifications; (2) a strong client orientation; (3) a deliberate use of substantive and procedural design science; (4) a holistic orientation, meaning that problems have to be analyzed, reviewed and tested in their context, i.e. holistically; and (5) a focus on the desired outcomes (van Aken, 2007).

Although much research within the design sciences is based on the explanatory science, the ultimate objective of research in Design Sciences is to develop valid and reliable knowledge to be used in designing solutions to field problems, which cannot be considered the same as the mere application of the basic laws of the explanatory sciences, for these do not take the body of knowledge developed by the design sciences themselves into account (van Aken, 2004). Each time a professional sets out to solve a unique and specific problem for a client, or in conjunction with a client, he or she does so by using the problem solving cycle, also called the regulative cycle (van Strien, 1997). This cycle consists roughly of: defining the problem out of its 'messy' context (Schön, 1983) 'naming and framing'), planning the intervention (diagnosis, design of alternative solutions, selection), applying the intervention and evaluating (van Aken, 2004). Historically, much of the discourse on design has extolled the virtues of completeness. Completeness allows for the pre-specification of a problem, the identification of pre-existing and non-existing alternatives and the choice of the most optimal solution (de Bono, 1998). Such a scientific approach to design pervades much of management thinking, education and research (Romme, 2003).

### ***3.2.4 Design Science procedures***

Design science research starts with designing or planning an action in advance or during the action. The outcome of this process is a design, which can be defined as a representation of the situation, system or process to be realized. In general, a design science researcher will make three plans or designs: (1) an intervention or set of interventions; (2) an implementation plan for the implementation of the intervention; and (3) a process-design, i.e. the researcher's own plan for the problem solving cycle, or, put differently, the method to be used to design the solution to the problem (van Aken, 1994;2004).

Much design science thinking is inspired by the material design sciences as for machines and buildings, and one may (consciously or unconsciously) think about design for management or organizational systems in quite similar ways as designing a building or a machine. Although there are significant similarities, there are also fundamental differences between material object design and organization design (van Aken, 2007). Three similarities concern aspects of material object design which are also important for management or organization design, planned change, and organization development:

- Hidden properties: All models are an abstraction of reality. Usually it is an abstraction of a presently existing reality, but in case of a design it is a model of a possible future and wanted reality. Compared to the model, the existing reality and finally realized design itself have innumerable hidden properties; properties that are present in reality but remain invisible in the model. This brings us to the principle of *minimal specification*: a completed design should (at least) give those who actually make the entity in question all the information they need to make it.
- Actual design process: After the establishment of the specifications, designing generally is accomplished by *synthesis-evaluation* iterations:
  - Synthesis: making a design for a solution for the field problem.
  - Evaluation: making an ex ante evaluation of the expected performance of the design against specifications “on paper”, that is on the basis of calculations, simulations, or argumentations, to select the best alternative. Designing is “playing with alternatives” and assessing various alternative solutions “on paper” thinking and communicating before one actually selects and implements an alternative in the material domain.
- Representation focus: A good design is necessary and sufficient for eventual performance; the attention of all actors in the process is focused on the design, the representation of the future entity itself. All the rest tends to be of secondary importance.

There are a number of significant and potentially useful approaches to synthesis. Denyer et al. (Denyer & Tranfield, 2006; Denyer et al., 2008) discuss several of them, although they offer neither a comprehensive catalogue nor a representative sample of present practice. We will not discuss them at large, either, but will, only mention the four methods they identify, and which they combine in their research. (1) Within many fields — medicine being the most obvious and probably the most advanced — the preferred approach to synthesis is statistical meta-analysis (Egger et al., 2001; Sutton et al., 2000); (2) Alternatively, some researchers promote the benefits of a traditional narrative approach (Hammersley, 2001), a less formalized method for summarizing large quantities of information; (3) In contrast, meta-ethnography approaches synthesis through interpretation rather than analysis and aims to preserve the social and theoretical contexts in which substantive findings emerge (Noblit & Hare, 1988:5-6); (4) Finally, Pawson (2002) proposes realist synthesis for analyzing the effectiveness of policy programs through the development and testing of theoretical ideas on intervention–outcome relations. Other fields such as medicine have progressed by reviewing the knowledge stocked in their science base and synthesizing the findings. Such an excursion is worthy of consideration and is potentially beneficial for management and organization studies. However, given the hyper-diversity in both content and method, addressing synthesis through aggregation as in medical science is rarely possible. Consequently, synthesis poses a key challenge (Denyer et al., 2008). Design science research applies available research methods in a pragmatic manner, dependent upon the aims of specific projects and the functionality of research methods (den Hertog et al., 2009). One could think of quantitative, qualitative and case study methods. Denyer and Tranfield (2006)



argue that qualitative research synthesis can provide an effective means of producing actionable knowledge base with which the dislocation of research from practice can be overcome, enabling managers to make better use of academic research.

### **3.2.5 Design propositions in CIMO**

By now it should be clear to the reader that Design Science is aimed at producing prescriptive *knowledge*, whereas the explanatory sciences produce *descriptive knowledge*. And as for the domain of application we have also distinguished organization design and management design. Van Aken (2004) proposes to use Miner's (1984) suggestion by making a distinction between Organization Theory and Management Theory. Organization Theory, then, is produced by research on the basis of the paradigm of the exploratory sciences and Management Theory by research on the basis of the design sciences. Organization Theory can be used in a conceptual way by practitioners and can also be used to feed research in Management Theory. As already proposed by Tsang (1997) – without using these terms – Organization Theory results can be used to derive potential *design propositions* or *design rules* (Plsek et al., 2007; Romme & Endenburg, 2006) – a heuristic statement, also called *means-end statement* (Andriessen, 2004) in the form of: if you want to achieve outcome Y in situation S, something like X might work or help – to be subsequently tested and further developed by Management Theory research and Organization Theory results can also be used as input to ground design propositions. Management Theory research uses the perspective of a player and uses in prevision intervention-outcome logic: what intervention should a player use in the given context to realize the desired outcome? Therefore, as will be discussed below, a key element of the research strategies in Management Theory is the in prevision field-testing of design propositions (van Aken, 2004).

There are significant differences between the causal models of description-driven research and the design propositions of prescription-driven research. Their causal logic is comparable: one or more dependent variables are produced, deterministically or stochastically, through one or more independent ones. However, one difference lies in the nature of the independent variables: in the case of the causal model these are elements already present in reality (and not always manipulable), while in the case of the design proposition it is a designed intervention to solve an improvement problem or a designed artifact, like an organization structure or management system, to solve a construction problem. Causal models can be and often are partial and so explain only certain aspects of the phenomenon of interest. If they are quantitative, they tend also to be strongly reductionistic, forced by the need for quantification. Design propositions, on the other hand, are holistic. A given intervention is applied in a certain context and all organizational and contextual factors have an impact on its outcome. In that sense design science is to a large extent context-bound (den Hertog et al., 2010). Some of the mechanisms determining the effectiveness of an intervention will be analyzed to ground the design proposition, but other factors will retain their 'black box' character. The description of proposition, context and outcome need not be reductionistic, but can use 'thick' qualitative text (Geertz, 1973). However, there are certain conditions a design proposition has to meet.

Based on Bunge's technological rule (Bunge, 1967), the logic of prescription is "if you want to achieve outcome O in context C, then use intervention type I". The key component of the design proposition is the intervention type I, a type of intervention or system to be used in solving the kind of problem in question. A design proposition can be seen as offering a general template for the creation of solutions for a particular class of field problems. Design propositions have to be field tested on pragmatic validity in their intended application domain. Pawson and Tilley (1997), add to the above argument by raising the issue of causality, i.e. by asking through which generative mechanisms the intervention produces the outcome in the given context (van Aken, 2004). Mechanisms

are used in several scientific fields, like philosophy, but haven't been properly defined. Mechanisms consist of component parts and their activities/interactions. They produce something. This production depends essentially on the hierarchical structure of mechanisms. Mechanism explanations are models of characteristics operating in organizational processes. It is always the combination of the component parts that as a whole activates the mechanism that produces the outcome, rather than any single activity alone (Pajunen, 2008). So, a mechanism is a plausible account of the process that causes a systematic relationship between variables.

This addition results in design propositions following what we call the "CIMO-logic". This logic is constructed as follows: in this class of problematic Contexts, use this Intervention type to invoke these generative Mechanism(s), to deliver these Outcome(s) (Denyer et al., 2008), see also Table 3-1.

Component	Explanation
<b>Interventions (I)</b>	The interventions managers or professionals have at their disposal to influence behavior such as: leadership style, planning and control systems, training, performance management. It is important to note that it is necessary to examine not just the nature of the intervention but also how they are implemented. Interventions carry with them hypotheses, which may or may not be shared. For example, "if we provide financial incentives to staff it will lead to higher worker motivation".
<b>Generative mechanisms (M)</b>	The mechanism that is triggered by the intervention in a certain context, e.g. empowerment, offers employees the means to contribute to some activity beyond their normal tasks or outside their normal sphere of interest, which then prompts participation and responsibility thus long-term benefit to themselves and/or their organization.
<b>Context (C)</b>	The surrounding (external and internal environment) factors and the nature of the human actors that influence the nature of the change in behavior, such as age, size, politics, power, technical system, stability, complexity, interdependencies. Interventions are embedded in a social system and as noted by Pawson and Tilley (Pawson & Tilley, 1997) will be affected by at least four contextual layers: the individual, interpersonal relationships, institutional setting and wider infrastructural system.
<b>Outcome (O)</b>	The outcome of the intervention in its various aspects, such as performance improvement, cost reduction or low error rates.

**Table 3-1: CIMO-logic, the components of design propositions (Denyer et al., 2008)**

Design propositions created in this way therefore contain information on what to do, in which situations, to produce what effect and offer some understanding why this happens. The design proposition is not the complete solution for any given business problem, it is merely one input to aid the design of the specific solution. Designing specific solutions typically demands much knowledge and expertise, such as knowledge of alternative design propositions with their CIMO-logic along with the evidence from field testing, as well as intimate knowledge of the local situation and business domain in question. The CIMO-logic constitutes only the logic of the design proposition, not its specific form. It is important to resist taking a mechanistic view, such as the prescription of a certain drug by a medical doctor to a patient, or the formula a civil engineer might use to calculate the maximum load of a bridge. Prescriptive knowledge is often expressed in directives such as "if A then do B" (IO-logic). However, design propositions in organization and management studies are seldom reduced to algorithms and can rather take the form of an article, a report, a training manual or a whole book (Denyer et al., 2008).

### ***3.2.6 Testing and grounding***

Bridging the gap between organization/management science and design practice raises numerous methodological questions. One of the basic questions is the question of validation and testing (de Sitter et al., 1997). Whereas the typical research product of the explanatory sciences is the causal model, the typical research product of the modern

design sciences is the tested and grounded design proposition. If the tested and grounded design proposition is the typical research product of a design science, the typical research strategy is clinical research, i.e. research on the performance of interventions or artifacts, executed within the context of intended use (van Aken, 2004). The causal model of the explanatory sciences is developed, typically, within a closed system (like a laboratory) in order to exclude (or control) the influences on the dependent variables from other sources than the independent variables of interest. A causal model may be partial, explaining only certain elements or aspects of the phenomenon of interest. The design proposition, on the other hand, is typically studied within its intended context of application, in order to be as sure as possible of its effectiveness, also under the influence of less well-known factors. Grounding a design proposition on explanatory laws does not necessarily mean that every aspect of it (and of its relations with the context) is understood. Typically, several aspects keep their 'black box' character and testing within the context is still very necessary to account for its effectiveness.

The typical research design to study and test design propositions is the multiple case study (Eisenhardt, 1989; Parkhe, 1993): a series of problems of the same class is solved, each by applying the problem solving cycle. Design knowledge is built up through the reflective cycle (van Aken, 1994): choosing a case, planning and implementing interventions (on the basis of the problem solving cycle), reflecting on the results and developing design knowledge to be tested and refined in subsequent cases. There are two types of multiple-case studies in Management Theory, i.e. the extracting and the developing multiple case-study. The extracting multiple case-study is a kind of best-practice research and is aimed at uncovering design propositions as already used in practice. In the developing multiple case-study the design propositions are developed and tested by the researcher(s) in close collaboration with the people in the field (Keizer et al., 2002). In developing and testing a design proposition through the multiple case and in analyzing its effectiveness through the cross-case analysis during the reflective cycle, one can gain insight in the indications and contra-indications for the application of that design proposition and hence also in its application-domain. A design proposition is typically not totally general, but applicable to a certain application-domain, a class of problems. By borrowing concepts from software development (Dolan & Matthews, 1993) one can say that research on design propositions typically goes through a stage of alpha-testing, i.e. testing and further development by the originator of the design proposition, to be followed by a stage of beta-testing, i.e. the testing of the design proposition by third parties (van Aken, 2004). An essential element of beta-testing is that testing is conducted by a third party to counteract the 'unrecognized defenses' of the originator of the design proposition, which may blind him or her to possible flaws in its use (Argyris, 1996). In beta-testing of managerial design propositions one is interested in both driving and blocking mechanisms (instances where the design proposition fails are also highly interesting). It is especially this grounding in driving and blocking mechanisms which will support the translation of the design proposition to other contexts (van Aken, 2004).

However, thorough and efficient grounding and testing may not always be possible, because of time and resources constraints. First of all, reaching the intended effect of the intervention or executing the interventions in it self may require such a long time, e.g. several years, that testing as a whole may not be appropriate. Second, finding enough testers in time could be problematic, for example in case of an application-domain in niches. An option then would be to introduce and accept the design on face value, and to evaluate it in use. This option, however, has several disadvantages: systematic testing is out of the question, troubleshooting may be difficult and users might tend to abandon the use on the first problem encountered, leaving the designer empty-handed. Another option is to have the design validated by a panel of appropriate stakeholders (Tan, 2010), e.g. potential users. Potential users use their own experience and ordinary

knowledge to judge research (Beyer & Trice, 1982). This form of validation is appropriate for assessing the feasibility of the design and overcomes the constraints of time and resources in case of effect measurement. Some types of research may be assessed more favorably than others by the criteria supplied by experience and ordinary knowledge. The methods of qualitative research are close to the methods used by people to acquire ordinary knowledge - on which they rely all the time (Beyer & Trice, 1982).

Based on this review of design science elements and aspects we can now present our approach in designing a protocol for customer involvement in innovations.

### **3.3 Research Design**

#### ***3.3.1 Combination of theory and practice***

As was mentioned in the first chapter, research of the phenomenon of customers and users participating in innovations is not new at all (Conway, 1993; Gardiner & Rothwell, 1985; Parkinson, 1982; von Hippel, 1979;1988). Therefore one can expect an abundance of academic literature on the matter, even though they are mainly descriptive of nature and mainly restricted to B2B contexts or based on a passive customer participation. But because of changing societal demands and technological possibilities, the topic of an active customer involvement, or co-creation is receiving more and more attention from practice which addresses the contemporary issues (Boswijk et al., 2005). In this respect, academic research follows at a distance, reducing the chance of finding solutions for the contemporary situation. On the other hand, many publications in managerial magazines, books and reports could provide possible solutions to our problem, but they also pose a challenge concerning the usability – validity and reliability - of this practice. Although they do not have to be facts, they may, however, provide important data to generate theory (Glaser & Strauss, 1967). Therefore, to enhance reliability and validity practice literature findings were triangulated (Jick, 1979) by either academic literature findings, by other practice literature that has been published independently from the concerned findings, or by expert interviews.

There are two ways to connect practice to academic research: (1) by using principles grounded in research to create solutions to be subsequently tested and implemented in practice (Romme & Endenburg, 2006); and (2) by experimentation with new practices and solutions that have been evidenced in practice to derive design propositions (Plsek et al., 2007). As is observed by Ellson:

“The debate must include consideration of the relevance of business schools and business research to business practice and should compare with the application of other living disciplines. A myopic preoccupation with measurement of research based more on quantity and ownership is perhaps the result of mistaking the effect for the cause. Business research is the consequence of business practice.” (Ellson, 2009:1161)

So, this research literature and practice publications functioned as an important point of departure for this study through research synthesis (Denyer et al., 2008). As Tsang (1997:86) suggests: we “pick off where empirical, descriptive researchers leave off”, but we did not refrain from reviewing practice as well. One of these practice sources came from the author’s working environment, in particular, the firm by which he is employed has also conducted a series of projects on the subject, providing relevant data for this research. This researcher’s experience should be deliberately used to cultivate reflections that can lead to insights for theory generation (Glaser & Strauss, 1967). Thus, the protocol has been designed on the basis of research synthesis in its broadest sense, looking at both academia and practice.

In this way, design propositions have been based on both propositions derived from practice and propositions based on scholarly knowledge, synthesizing theoretical knowledge and practical wisdom in better understanding of customer involvement in innovations into design propositions that can be generalized to other industries (Man et al., 2010). The design propositions, together with requirements for the design, then have been translated into the intended protocol. This protocol gives an answer to the following questions:

- a. What is the typical innovation process that organizations might follow?
- b. In which process steps or phases is it appropriate to co-create with customers?
- c. What are the features of these customers?
- d. How to find and select them?
- e. How to engage, motivate and activate them? And, how to keep them engaged, motivated and active?
- f. What methods, techniques and tools should the firm apply to have the most effective input from these participants?

### **3.3.2 Research design phases**

The research has been subdivided into four phases:

1. *Phase 1: Initial designing of the protocol: Systematic research of literature* (both academic and management), to search for explicit elements or pieces already identified in existing research, analysis of previous projects, followed by expert interviews to identify and cross-check the tacit elements that also should be in the protocol, which have been finalized in 28 design propositions.
2. *Phase 2: Testing and further development of the protocol.* Following the initial design phase the protocol has been tested and grounded in practice by having it reviewed by academics, experts and potential users. The protocol design has been adjusted on basis of the review results.
3. *Phase 3: Design Completion.* Analysis and interpretation of the results, in order to improve and complete the model, as well the generation of theory.
4. *Phase 4: Diffusion of the design.* Publication of research findings through conferences, consulting, articles and this thesis.

In the following sections we will elaborate on this research logic and choices for the four phases. An elaborated and detailed description Phase 3, design completion, will follow the description of the protocol in Chapter 11.

## **3.4 Phase 1 Initial design**

As has been explained previously, the overall approach in the design of the protocol is based on the *research synthesis* approach (Denyer et al., 2008) of both theory and practice (Glaser & Strauss, 1967). It consisted of (1) study of theory on customer co-creation in innovations; (2) study of practice in customer co-creation in innovations; and (3) expert interviews in order to get an as complete as possible overview of theory and practice concerning customer co-creation in innovations. In this approach additional aid has been obtained by the thesis study of two master students, focusing on a specific aspect or part of the research problem. To intermittently test and validate the findings

from these forms of research, potential users have been consulted in a co-creation session.

### ***3.4.1 Study of theory on customer co-creation in innovations***

The study on theory on customer co-creation in innovations was intended to accomplish two goals: (1) To identify the explicit, main elements of the design in terms of phases or steps of the innovation process where customer co-creation is recommended or opportune, the kind of customers to involve in these respective phases, the procedures to engage and activate these co-creating customers, the methods, techniques and tools one can use to support the customer participation in the process, and possible relevant differences for industry, firm size, business-to-consumer vs. business-to-business context, etc; (2) to identify cases and experts in the field whose opinion can be used to further enhance the design, specifically with tacit knowledge and experience on the subject by desk research (case studies from secondary sources). Experts were academics, practitioners or managers, who have researched, described, organized or managed one or more innovation initiatives for co-creation with customers. For this purpose the literature study was extended with the review of management books, magazine, newspaper and website articles.

The analysis thus resulted in a clear definition of the phenomenon or construct *customer co-creation in innovations* – which we abbreviated with 3CI (pronounce Triple-Cee-Aye) – and which we deconstructed in a set of three main aspects – context, customer and process – of the involvement. Each main aspect was further divided into some specific elements that formed that aspect. Thus a 3CI framework was constructed for further development of the design.

### ***3.4.2 Study of practice on customer co-creation in innovations***

Next, a number of cases were studied and analyzed to enhance our insights for the subject. Cases were extracted from information gathered by Altuition projects executed in the past, and other cases, described in non-academic literature focused on practice, like Harvard Business Review, Sloan Management Review, McKinsey Quarterly, Forrester, Gartner, newspapers, and such. Since these publications hardly encounter the timeliness challenge academic research faces by going through a time consuming editorial review, they provided us with more recent cases than academic literature has. The review of management books and articles thus served both the identification of experts (see subsection 3.4.1), as the analysis of up-to-date findings and results on the topic. To enhance the reliability of our cases from secondary sources, these cases were cross checked with the interviewed experts or with available academic literature, e.g. the LEGO and the Procter & Gamble case. The analysis has been executed by applying the 3CI framework, mentioned in the preceding sub-section, and comparing them through application of the constant comparison method (Glaser & Strauss, 1967). This resulted in several key observations for each case which serve as insights for the development of the design propositions.

### ***3.4.3 Expert interviews***

Expert interviews were executed to obtain whatever knowledge there already exists on involving customers in the firm's innovation process and initiatives. Experts consisted of scholars in the field of customer generated innovations, practitioners in the field and managers of companies that have experience in innovating with customers. Plsek et al. (2007) propose four methods for extracting tacit knowledge from experienced practitioners in organizational change, in order to elicit design propositions: (1) reviewing written documentation of programs in order to extract design propositions; (2) convening groups of experts and asking them to describe what they do, or see themselves as doing,

in the form of design propositions; (3) listening to the stories of change efforts told by change leaders, operational managers, and front-line staff and then extracting design propositions off-line; and (4) posing hypothetical scenarios to those experienced in the subject field, asking them to 'think aloud' about how they would approach the situation, and then extracting design propositions off-line. Because none of these four methods is sufficient and complete in itself regarding the desired outcome – for instance, documents review does not reveal the actual outcomes of interventions or their mechanisms, and having experts writing down their design propositions requires a good understanding of the elements of design propositions – we chose to apply a combination of these methods, the first, third and fourth in particular. Aside from a description of the cases or projects for which the qualification customer-generated innovation is applicable, a brief evaluation of their successes, these interviews also focused on a joint – interviewer and expert – analysis of the most successful and the least successful projects or cases done by the interviewed expert by applying the CIT, Critical Incident Technique (Fivars, 1980; Flanagan, 1954) in order to collect relevant aspects, factors and conditions for the success or failure of the projects. In addition, where relevant, the expert's input was used to cross validate cases obtained from secondary sources, e.g. the LEGO and Procter & Gamble cases. In selecting the experts the *pyramid networking* (Lilien et al., 2002) approach was used; experts that were interviewed were also asked to point out (other) experts in the field which would be worth interviewing. Interviews were conducted by email, chat or a personal visit, depending not only on technical facilities, interviewee preferences and distances, but also on the contribution, expected from this person. Interviews were conducted until a saturation of input and data is obtained (Glaser & Strauss, 1967). The interview protocol for these expert interviews is attached in Appendix B. Each interview was transcribed and recorded in a report, which was member checked with the interviewed expert. Expert interviews that were used to cross validate cases in secondary sources also resulted in a case description that was submitted for review to the expert. In sum, experts were not required to propose design proposition – these propositions were developed off-line, reviewing interview transcripts in conjunction.

#### **3.4.4 Support from master students**

The research synthesis was divided in two separate subtasks where two master students, van Daelen (2005) and Geerts (2009) conducted specific research on tools suited for the support of customer co-creation in innovations, respectively an online phenomenon of user involvement, i.e. crowdsourcing. Their results and findings were reported in their master thesis, and are incorporated in the protocol design.

Supplementary literature searches were conducted using keywords and databases (Cooper & Hedges, 1994), and a snowballing technique (pursuing references of references) was employed. This search strategy is particularly important for locating complex sources of evidence (Greenhalgh & Peacock, 2005) for it explores interesting leads and identifies associated literatures such as books, conference papers and selected internet documents. The selection of articles chosen was based on the criterion 'fit for purpose'. This criterion has been developed by Boaz and Ashby (2003), who suggest that it helps in avoiding the technocratic preoccupation with elegant research designs. Pawson (2002) concurs, suggesting that the researcher simply asks whether or not the literature retrieved adds anything new to understanding the phenomenon (Denyer et al., 2008).

#### **3.4.5 Analysis of data**

Literature, expert interviews and cases were analyzed with the aim of building the protocol through a process called the constant comparative method (Glaser & Strauss, 1967) and similar to the "extended case method", that aims to integrate and synthesize existing bodies of work (Burawoy, 1991). We can justify this choice by Burawoy's explanation:

"The generation of theory from the ground up was perhaps imperative at the beginning of the sociological enterprise, but with the proliferation of theories, reconstruction becomes even more urgent. Rather than always starting from scratch and developing new theories, we should try to consolidate and develop what we have already produced." (Burawoy, 1991:26)

In contrast to a strict grounded theory approach (Glaser & Strauss, 1967), the primary focus of the extended case study is not to build *new* theory. The goal of the extended case method is to integrate and extend *existing* theory (Danneels, 2003). It applies reflexive science – e.g. one's own experience – in order to extract the general from the unique by building on pre-existing theory (Burawoy, 1991). It is a view that is supported by several other scholars (Orton, 1997; Strauss, 1987; Strauss & Corbin, 1990; Vaughan, 1992). In our approach this means that each publication – transcriptions and reports of expert interviews included – was treated as a single qualitative case. Each case was systematically analyzed by coding and categorizing (Spiggle, 1994) constructs, comparing (Glaser & Strauss, 1967; Spiggle, 1994) cases with each other, thereby identifying the relationships between constructs<sup>8</sup> in terms of input-output or intervention-outcome (IO). During these activities insight was also created in the most important determinants of successful customer co-creation in innovations, leading to the 3CI framework which contains the possible outcomes for these determinants, which can be viewed as the generalization resulting from the comparison of the particular cases (Burawoy, 1991). This approach resulted in a set of design requirements, consisting of functional and operational requirements, boundary conditions and design restrictions (Wijnen et al., 1995) for the protocol to be designed.

Then these design requirements, in particular the functional and operational ones, in conjunction with the 3CI framework were used to develop our design propositions, useful for the protocol. To develop design propositions we used the CIMO-logic which forced us to also identify the underlying mechanisms for the IO relationships. In this respect it was necessary to explore and study additional, not previously studied literature in psychology, sociology, technology, and organizational science, because existing literature on customer co-creation in innovations was not available or elaborative enough on the underlying mechanisms for describing the design propositions sufficiently with CIMO-logic.

This activity resulted in 28 design propositions that together formed the basis for the protocol. The protocol was designed by defining a framework that offers alternative routes, based on these requirements.

### **3.4.6 Design**

The design propositions, together with the protocol design requirements were integrated in the intended design; an intervention that firms can apply in case of starting an innovation initiative in which they want to co-create with the customer. The design is a recommendation<sup>9</sup> to firm managers responsible for managing these innovations and consists of the following elements:

- Process phases or steps where customer co-creation is appropriate or opportune;
- Criteria for finding and selecting the right kind of customers to involve;

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<sup>8</sup> For the coding of, comparison of and identification of relations between constructs the qualitative analysis software named Atlas.ti (version 5) was used.

<sup>9</sup> The word 'recommendation' is used because the solution offered in this design is not considered to be the *one and only*, *best* or *optimal* solution for the given problem, as is the case with most designs.



- Ways to interest and motivate customers to participate for the phase they have been selected;
- Methods, techniques and tools to apply in order to support customer participation in co-creation;
- Do's and don'ts for this customer co-creation approach.

One should be aware that each industry and even each organization has its own peculiarities, for which we can develop detailed lines of action. However, to do so will not be economically feasible, is not efficient, so our design outcome is of a robust nature (de Bono, 1998). It has the implicit assumption that the underlying process and pattern of innovating is similar for all businesses (Tidd et al., 2001; van de Ven et al., 1989). But it will investigate some high level specifics of industries and organizations like sector (Pavitt, 1984), size (Hoffman et al., 1998; Rothwell, 1978), product/service/technology maturity (Abernathy & Utterback, 1978; Tushman & Anderson, 1986; Utterback, 1994) and differences between radical and incremental innovation (Christensen, 1997; Imai, 1990; Rothwell & Gardiner, 1985). But this contribution to the design will be mainly of an explorative nature<sup>10</sup>, keeping the design as robust as possible. Another reason for pursuing a robust design is that descriptive research is usually limited by the evident fact that it can only draw on what has already happened. As a result, the more the future differs from the past, the more misleading specifically targeted applied research from the past can be. Basic research that aims at generality, rather than specificity, may better retain whatever accuracy it has achieved and, therefore, its usefulness over time (Beyer & Trice, 1982).

As Argyris (1996:86) puts it:

"Robert Duncan, a scholar of organizational behavior known by many readers of this journal, told me that he did not find his own work, or that of many of his fellow social scientists helpful in acting as provost. Indeed he found some of the "softer" less rigorous work more helpful. This does not mean, in my opinion, nor in Duncan's, that we should continue to develop less rigorous research. It means, I suggest, that we have to conduct rigorous research that produces propositions that not only have high external validity but they are teachable, learnable, and useable by practitioners in every day life."

### 3.5 Phase 2 +3: Testing and design completion

The next phase of the research involved testing, revising and refining the preliminary theory. We used a practical test to test practical propositions. The concept of practical tests provides us with a criterion for truth: the success criterion. According to this criterion, a practical proposition is true if action based on that proposition leads to success as defined by the proposition (Andriessen, 2004). To check if the design is valid in a pragmatic sense, we tested it in two ways. First, the protocol was applied in its own development, by having it tested as a concept by potential users. The next step was conducted by having it peer reviewed by experts and potential users. Reviewers were selected, based on their expertise in the field as has emerged from literature study and expert interviews, and based on their potential of being a user of the protocol. To this latter avail, the author's network served as a basis.

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<sup>10</sup> One could think of an expression in this nature: "If there's a mention of condition B instead of B, one should not do X1 but X2, e.g. for SME's it will be difficult to create an online community, so one could apply physical encounters with customers."

### ***3.5.1 Evaluation of success***

Zhang and Doll (2001) observe that studies on NPD use mainly three variables to measure NPD success: process performance, product effectiveness, and financial performance. The end outcome and the ambition of involving customers in innovations are to launch products or services that become a commercial success and contribute to growth. However, to wait for this to happen could take quite a long time, too long for this research. In addition, due to the complexity of innovation processes and because they involve processes of interaction among many actors – Open Innovation – many features of such processes can only be extracted, isolated and counted in a laboratory setting with great difficulty. Thus, controlled experiments as in natural or medical sciences are impossible to conduct (Romme & Endenburg, 2006). Besides, the commercial success of the innovation and growth in particular depend on more factors than customer involvement alone. Issues as project management, technology, and competition are also relevant for the success of an innovation (Bessant, 1993; Henderson & Clark, 1990; Lilien & Yoon, 1989; Tidd et al., 2001). It wouldn't be practical and wise to measure the design's effectiveness by measuring the innovation success. Regarding this limitation, Sørensen et al. (2010) propose to conduct innovation experiments to test new and previously non-existent innovation procedures which can later be utilized in 'real life'.

Because there are unique features to each situation and all kind of factors which could explain the success or failure of an implemented design, judgment of the validity of a design is difficult. Of course, judgment will also be based on practical success, but to measure this is still the question. According to de Sitter et al. (1997) success can be made visible by the interest shown by managements for a specific approach relative to other approaches and in the level of satisfaction shown by managements who have followed a specific approach.

### ***3.5.2 Co-creation with potential users***

An important step in the design of the protocol was the involvement of potential users in its development. Organizational scholars have concluded that people are likely to react more favourably and enhance their commitment to carry out decisions in which they participated than those in which they did not. Results of research on research utilization are consistent with this conclusion. Researchers repeatedly report that users who participate in earlier phases of research react favourably to results. Users who participate in research may feel supportive because they have had greater opportunities to shape the research to provide results that support what they want to do or are already doing (Beyer & Trice, 1982). Thus, it is tempting to conclude, as many have, that user participation in research is positively related and perhaps essential to its utilization. Because of this mechanism, a co-creation session was held with 8 practitioners in the field of marketing and product/service development, where the initial design propositions were presented, illustrated with cases, and discussed on practicality implications. The result of this session not only entailed a confirmation of most design proposition to be relevant and plausible, but also in the enhancement of some of them. In this way design propositions were co-created with potential users of this protocol.

### ***3.5.3 Review of the design***

Following the co-creation of the design propositions, a user review was conducted. The review was designed to be conducted in two stages. To start with each reviewer had to comment on the design individually and independent from the other reviewers – which he/she was not aware of being reviewers as well. Because this independent and blind review could result in some contradictory comments, a second stage was staged by means of the Delphi method (Linstone & Turoff, 2002). This aimed to result in a kind of consensus in comments, useful for the adaptation of the design. During and after each

review stage the results were to be evaluated and the design and data collection method adapted for the next stage, overlapping data collection, analysis and design (Eisenhardt, 1989). The outcome of the review had to reveal findings that the design was either incomplete or incorrect in certain parts. This then should lead to adaptations to the initial design, surmounting in an end version of the protocol that is to be presented as the result of this research. The knowledge obtained from the study of the outcome of reviewing the protocol was therefore to be used to revise and refine on the prescriptions which were implemented and the result investigated again (Tsang, 1997). Thus, the final design is the result of iterative redesign.

"Hopefully, after a few such iterations, we are able to arrive at a good theory." (Tsang, 1997:86)

#### **3.5.4 Phase 3: Design completion**

Data collection was done by using a set of methods and techniques consisting of interviews and a questionnaire, and other, both qualitative and quantitative methods to enable triangulation (Jick, 1979). Analysis was performed according to the grounded theory (Glaser & Strauss, 1967), in which both positivistic as hermeneutic principles were applied complementary (Gummesson, 2000). Justification for the validity of the protocol was found when the interviewed users – experts, managers and new product developers – stated that the protocol in use does indeed lead to effective and efficient contributions with participants.

Contrary to the expectations stated in 3.5.3 the expert and potential user review resulted in a high degree of consensus for the expected effectivity of the protocol. Comments and suggestions merely affected overview, style and semantics of the protocol. Therefore the second stage in the review, the Delphi inquiry, has been cancelled. Based on the comments by the reviewers, the design was finalized. In the evaluation of the design its limitations also emerged. These were stated as part of the completion process.

### **3.6 Phase 4: Diffusion of the design**

If researchers want their research to be used, they should act as their own self-advocates and disseminate their research findings in magazines read by users as well as in professional journals. They should devote continuous efforts toward consulting and executive training with levels of management appropriate to the variables they study. Also, researchers should pay more attention to diffusing research to future potential users through textbooks and their own teaching activities (Beyer & Trice, 1982).

Aside from this thesis, our design has been advertised in several ways:

1. A paper presentation at the International Mass Customization Conference (IMCM) in 2008 in Copenhagen, Denmark (Weber, 2008a);
2. Another paper presentation at the Mass Customization and Personalization Central Europe conference (MCP-CE) in 2008, Palic, Serbia (Weber, 2008c);
3. A paper presentation at the International Conference on Management of Innovations and Technology (ICMIT) in 2008, Bangkok, Thailand (Weber, 2008b). This paper was proposed by the Organizing Committee for publication. After adaptation for the newest insights, peer review and revision it was accepted for publication in the International Journal of Innovation and Technology Management (Weber et al., forthcoming);

4. Presentation of one case of Customer Co-Creation in Innovations at the Mass Customization and Personalization Conference (MCPC) in 2009, in Helsinki, Finland (Weber, 2009a);
5. Submission, peer review and acceptance of a paper to be published as a chapter in the Handbook of Research on Trends in Product Design and Development, co-authored by Simone Geerts, one of the master students mentioned in sub-section 3.4.4 (Weber & Geerts, 2011).

In addition, insights acquired while designing the protocol, were used to consult several organizations conducting a project on (an aspect) of the research subject. This consulting can't be acknowledged as validation cases, since the protocol was not available at the time and because of the fact that customer co-creation formed only an aspect of the whole projects in question.

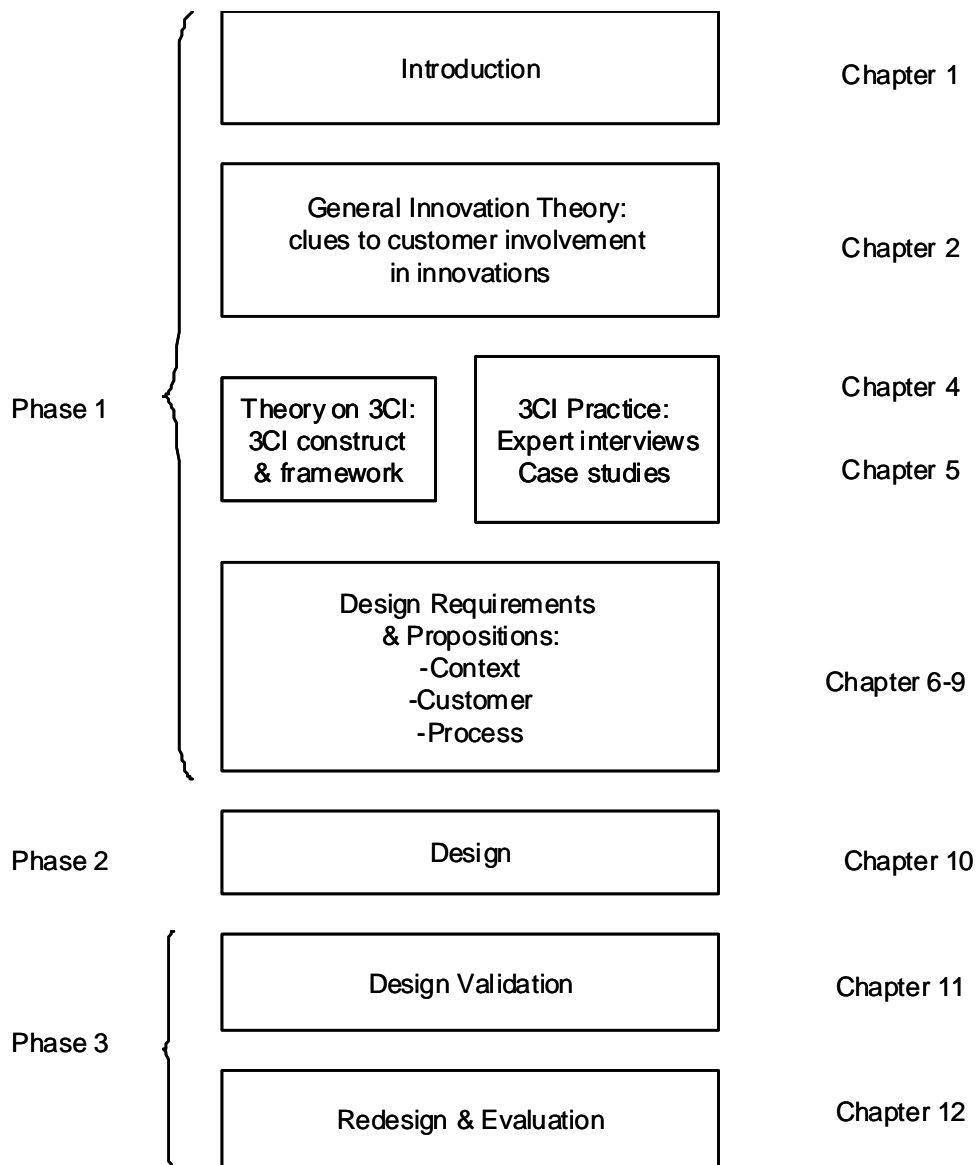
### 3.7 Summary and conclusions

To accomplish our research objectives, i.e. to develop a protocol for firms that want to co-create with their customers, we based our research design on the Design Science methodology. The research has been subdivided into four phases:

1. *Phase 1: Initial designing of the protocol: Systematic literature study*, to search for explicit elements or pieces already identified in existing research, analysis of previous projects, followed by expert interviews to identify the tacit elements that also should be in the protocol, finalized into 28 design propositions.
2. *Phase 2: Testing and further development of the protocol*. Following the initial design phase the protocol has been tested and grounded in practice by having it reviewed by a panel of experts.
3. *Phase 3: Design Completion*. Analysis and interpretation of the results, in order to improve and complete the model, the generation of theory.
4. *Phase 4: Diffusion of the design* through publications, conferences, consulting and capturing the research findings in this thesis.

We can visualize this approach in the schematic diagram, depicted in Figure 3-1.

As can be observed the diagram shows us the concurrent chapters and/or sections which deal with that particular part of the research. In the next chapter we will start with the study of academic literature on the subject of customer co-creation in innovations, followed by some practices (Chapter 5). Next we start the design cycle by stating the design requirements (Chapter 6), culminating in the formulation of design propositions (Chapter 7 - Chapter 9). After these elaborative activities the protocol is presented (Chapter 10), along with the test results and their consequences for the protocol (Chapter 11 and Chapter 12).



**Figure 3-1: Schematic representation of research design**

# **Chapter 4 Theory on customer co-creation in innovations**

## **4.1 Introduction**

In this chapter we will focus on existing and contemporary theory on the subject of user or customer co-creation in innovations. To start with we will explore the emergence of this form of active customer involvement in innovations, new product or new service development (section 4.2), look into what causes its increasing application (section 4.3) and review literature on what is already proposed to effectively apply customer co-creation in innovations (section 4.4). Next we will elaborate by exemplifying and describing several appearances of this phenomenon (section 4.5 through 4.13). We will conclude the chapter by introducing the construct of customer co-creation in innovations and a framework to develop our design propositions (section 4.14).

We acknowledge that the terminology in literature can be confusing. There seems to be a preference for the term customer involvement in innovations, where most authors refer to the same construct as our 'customer co-creation in innovations'. But sometimes it is not evident that the author is referring to the same construct or using a different meaning for the wording 'customer involvement', for instance implying a passive form of involvement as well. We will use the term customer co-creation unless we know or suspect that the original author(s) is referring to a different meaning. The same consideration applies to terms as 'customer' and 'user'. We will use the term 'customer' unless mentioned otherwise, for instance where the author intentionally refers to users instead of encompassing customers.

## **4.2 Acknowledgement of customer co-creation in innovations**

For most 20<sup>th</sup> century firms the closed innovation model worked well with the first, second and third generation process models – internal R&D focus, product innovation orientation, self-reliance, tight control and generation of own ideas to develop, manufacture, market, distribute, and service new products (Davenport et al., 2006). The open innovation approach, however, views the locus of innovation beyond the confines of central R&D departments, now situated among various startups, universities, research consortia, incubators, and other outside organizations, including customers. Specifically the fifth generation process model is being applied by firms that have adopted the open innovation paradigm. One of the typical characteristics of the fifth generation innovation process model entails the involvement of leading-edge users in design and development activities (Rothwell, 1994). Users who are technologically strong and innovation-demanding can assist in increasing development speed and reducing development costs especially if, as in the case of partnering suppliers, they become actively involved in product development. Perhaps the most obvious example of this is when the user is also the inventor of the new product and has created a rough prototype for own use before transferring the design to the manufacturer. In this case, development times are shortened and development costs are effectively subsidized through the user's initial and subsequent design and technological contributions (Shaw, 1985; von Hippel, 1988), leading to a better performance of the firm (Laursen & Salter, 2006). Customers have a vested interest in product development: being integrated with the supplier firm ensures that their voice will be heard and that their recommendations and suggestions would be incorporated in the design of new products (Koufteros et al., 2005) or services (Drew, 1995a). Leading edge users can also make a significant contribution to later

developments along the product's design trajectory (Rothwell, 1986). Information from the project can be useful to customers for planning purposes such as product features, pricing, and product release dates (Koufteros et al., 2005).

The traditional model of NPD illustrates a process that starts with the generation of ideas, undergoes a number of stages and finally leads to the commercial launch of new products (Cooper, 1996; Cooper & Kleinschmidt, 1993). This traditional model of NPD focuses on different screening stages and involves only the partial integration of externals (customers) at early stages (Perunovic & Christiansen, 2005; Rice et al., 1998; Rothwell, 1994; Rothwell & Gardiner, 1985; Veryzer Jr., 1998b). While early models of innovation were focused on firm internal capabilities and R&D, later generations (starting with the third generation model) feature a more complex process of innovation, including internal as well as external sources of innovation alike, and emphasizing the importance of users in the innovation process (Holt, 1988). Rothwell (1994) sees the 5<sup>th</sup> generation innovation as a multi-actor process which requires high levels of integration at both intra- and inter-firm levels and which is increasingly facilitated by IT-based networking. Whilst his work did not explicitly mention the Internet, it is clear that the kinds of innovation management challenge posed by the emergence of this new form fit well with the model.

Customer participation in new product development (NPD) has been widely acknowledged in the literature (Biemans, 1991; Evans, 1996; Gemünden et al., 1992; Gemünden et al., 1996; Leonard, 1999; Rothwell, 1986; Shaw, 1985). We observe, however, that most of these viewpoints apply to industrial goods and in some cases industrial services. As a source for new product ideas, Hanna et al. (1995) showed that B2C rely more on R&D, while B2B used customers as a primary source for innovation. Athaide and Stump (1999) confirm this and state that in mature industries like consumer goods, NPD is usually depicted as a non-interactive, seller-led process, where individual customers play a relatively passive role during particular phases of the NPD process like concept testing and market testing, contrary to technology based, industrial innovation. Sandén et al. (2006) found that a majority (51.8%) of the B2C companies involve customers through the use of traditional market research techniques and give the customers the role of informants. Twenty-seven percent of the respondents state that they use customers as experts during part of the development process and six percent work with customers as partners. In a B2B context, most respondents (46%) indicate they use customers first and foremost as experts. Eleven percent work with customers as partners and seven percent state that a majority of their new products and/or services are actually developed by customers. Industrial innovations are characterized by close and frequent interactions between sellers and buyers, often in the way of collaborative relationship. In industrial contexts firms usually know their lead users or customers. In many cases, however, the industrial customer is the company's *decision making unit* (DMU) for procurements, and is not necessary the user of the goods and services.

As for services, the underlying logic that customers are co-producers in service provision meaning that they are directly involved in the value creation process (Bowen, 1986; Kelley et al., 1990; Lovelock & Young, 1979; Mills & Morris, 1986), implies that customers can and do contribute in the development and design of new services (Edvardsson et al., 2006; Johnes & Storey, 1998; Martin & Horne, 1995). The usual strategy for a professional service firm is to create a service with a pilot client and after that duplicate and further develop that service with other clients (Smedlund, 2008). Gray and Hooley (2002) argue that the relationship should be stronger for service firms than for manufacturing firms, due to the greater dependence on customer interactions. The findings of a meta-analysis over the five continents by Rodriguez Cano et al. (2004) support this argument. The application of information technology can enhance this interaction, creating and supporting new forms of customer co-creation in both service delivery and innovation (van der Aa & Elfring, 2002). Customer co-creation in innovations in service industries should be important (de Brentani, 1989;1995; Jallat et al., 1992),

while other research indicates that customers are not much involved (de Brentani, 1993; Gadrey et al., 1993; Johne & Storey, 1998; Martin & Horne, 1995; Sundbo, 1997). The involvement of customers throughout the development process, and the close integration of different perspectives will be of particular importance, but the overall map of the process is the same as with products (Tidd et al., 2001). Alam and Perry (2002) found that large organizations all conduct the stages in a sequential order, while small organizations did some parallel, especially in the start of the program. Such an approach would ensure that customers, roles and key staff from different supportive activities are involved in key aspects of the process. These would include defining the service product concept and testing those aspects that make it unique and specifying the operational elements required to implement it. Thus, customers and staff from supportive activities should play a role in the development of new service products (Edgett & Parkinson, 1994). Because of service characteristics, like intangibility, heterogeneity, perishability and inseparability, customer input and involvement in the service innovation process may be more useful than for tangible products (Martin & Horne, 1995). Customers can even participate in the design of operations and the firm itself as well, involving them in process innovations (Schneider & Bowen, 1995). For example, in marketing, rather than having customers just complete a market research survey, customers could actually co-design the survey. Or, like Federal Express, customers can be involved in designing information-processing systems for tracking deliveries, service and billing. Finally, customers can be consulted regarding human resourcing in firms, like deciding on how to best hire and train employees, or having customers nominate the employee of the month. Customer involvement or participation can therefore be applied in several different modes and intensities, but seems to be particularly useful to industrial settings. Researchers have shown that the corporate customer's role is more important and extensive than in retail markets, mainly because services and products offered to organizations are characterized by high customization to customer needs (Jackson & Cooper, 1988; Parkinson, 1985), mainly because the number of customers for a company in industrial settings is usually smaller than in consumer settings. Whether these findings and observations also apply to consumer settings, is something that has not been studied extensively, yet.

Firms tend to structure their innovation management systems and processes around a kind of 'steady state' of change, in which innovation does happen but generally in the direction of 'doing what we do better'. This leads to closer interactions with customers to help identify and implement a series of incremental product improvements, and a close monitoring of process parameters to move even closer to optimum conditions for quality, speed, costs, etc. Such innovation – which by its nature tends to be more incremental in nature – is essential for the survival of the business, but under certain circumstances this may not be the best approach. The firm is not able to pick up or respond well to weak signals about disruptive change (Christensen, 1997). Firms may lose leadership positions by listening too intense and carefully to customers (Christensen & Bower, 1996; Treacy & Wiersema, 1995). By contrast the signals about the new generation of products come as weak signals from the fringes of the current market, from a new group of users with radically different performance/price expectations and with the potential to create demand to exploit a step change in technological potential (Tidd et al., 2001). Danneels (2004) criticizes this view by pointing out that the firms portrayed in Christensen's study (Christensen, 1997) had a shallow understanding of customer needs. A deep understanding of customers' latent and unexpressed needs is a characteristic of customer or market orientation (Slater & Narver, 1998). Latent needs can be referred to as what customers really value or the products and services they need, but have never experienced or would never think to request (Senge, 1990). Rothwell and Gardiner (1985) show us that while potential users can make a significant contribution to the development of a radical innovation once its technical and commercial viability have been established, initially they may have a negative influence through resisting it, or simply



through ignoring it. The challenge is to find some way of resolving the innovator's dilemma to both incremental as radical innovations. Von Hippel (1988) found that contrary to ordinary users, *lead users* do not exhibit this tendency to stick to the steady state and are very well capable of developing radical innovations. The implication of this debate is that for customer co-creation in innovations we will have to make a distinction in co-creation in (1) radical/disruptive innovations that, according to theory might require participation of lead users, and (2) incremental/sustaining innovations in which participation of ordinary customers seems possible.

### 4.3 Enabling factors for increasing customer involvement

As has been highlighted in the previous subsection, the 5<sup>th</sup> generation process model brings out the increasing role of customers in product or service development, as observed by von Hippel (1988), Rothwell (1994) and Shaw (1983;1985). Evans (1996) cites several case examples of companies that have successfully incorporated the voice of the customer into the NPD process. For example, at Ames Rubber Corporation customers work directly with design engineers on NPD teams. Taninecz (1996) found that 23 of the 25 Best Plant finalists reported having direct customer involvement in product development. Typically, these observations mainly apply to the industrial and technological sectors. But, similar developments can be observed in consumer and service sectors as well.

Davenport et al. (2006) believe that the global economy has passed a 'tipping point' in the transition from an industrial, goods-centered to an innovation, service-centered logic they call the Innovation Economy. Among the eight drivers of this economy they identify that knowledge-empowered customers are driving innovations in many industries and enterprises. Customers co-create value along with the companies that serve them (Prahalad & Ramaswamy, 2003). A common denominator of the drivers is that each draws on ICT advances that enable universal access to knowledge that previously was dispersed and difficult to reach. This connected knowledge system enables the real-time coordination of dispersed organizational activities and groups, the management of cross-functional processes, and the synchronization of the myriad points of customer contact that are integral to the new dominant logic<sup>11</sup>. Customers in the Innovation Economy need individual, customized products (Kanter, 2001; van Asseldonk, 1998), have a global orientation, are convenience oriented, demanding multi-channel and diverse alternatives, are service oriented, with a focus on added value, are co-creators of knowledge, and empowered and want influence (Thompson, 2003), whereas in the Industrial Economy they were conforming to mass needs, were locally and product oriented, used to limited alternatives, with limited knowledge and influence (Prahalad & Ramaswamy, 2003). This change from customers as markets to customers as individuals represents a dramatic change from mass production to mass customization in an increasing number of industries. Therefore, the implication of this shift entails, apart from other ones, that management should have a co-creating mentality (Senge et al., 2001) and should embrace customization, referring to the new focus on customers as the real 'drivers' of organizations, even co-creators of value, rather than something external and ancillary to the organization (Vargo & Lusch, 2004). Knowledge-driven technologies, like the Internet, enable this co-creation with consumers, because it is possible for firms to start and have a dialogue with customers (Boswijk et al., 2005; Friesen, 2001; Lundkvist & Yakhlef, 2004; Ramírez, 1999; Verona et al., 2006). Ignoring this possibility entails the

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<sup>11</sup> A dominant logic for an organization is a paradigm, a theory in use or organizational code: deeply held and often unspoken beliefs containing values and assumptions about the world, its industry and its organization that guide the behavior of the organizational members.

risk of being attacked by one or a few customers publicly, endangering the continuity of companies (Kanter, 2001).

We can thus conclude that customer demand and increasing knowledge, in combination with information technology developments have enabled and facilitated the increasing role of customers in value creation, leading to the mentioned customer co-creation in innovations.

## **4.4 Customer co-creation in innovations**

### ***4.4.1 Market or customer orientation is needed***

Rothwell (1992) and Cooper (1980) provide good summaries of key factors that appear to emerge in many studies, in relation to firms that are technically progressive or associated with successful innovation. One first factor (Ahmed, 1998; Rothwell, 1992) underpinning successful innovation is: establishing effective linkages with external institutions and bodies of technical know-how, creating good internal and external communication, and possessing a willingness to accept and adopt "external" ideas." We can recognize this as Open Innovation. Another factor is about

"building a strong market orientation, emphasizing user-needs, building customer linkages, and involving users in the development process. (Ahmed, 1998:45)"

Customers have important information that can be vital to open innovation. Open Innovation companies invite the customer into the innovation process as a partner and co-producer (Chesbrough, 2003). By taking open innovation a step further, companies are allowing individuals, particularly customers, to play a much more active role in the product innovation process. Ahmed's research (1998) among medium size firms identified a typical characteristic of the highly innovative companies concerning their customer interaction and stimulation. Ahmed describes it:

"These companies had frequent interaction with customers and with businesses. There was a lot of dialogue back and forth about strategic directions and current growth markets. For instance, engineers from the science laboratories were encouraged to make external visits in order to better understand market needs and use these insights to solve new customer problems (Ahmed, 1998:53)."

One of the characteristics of market orientation is a deep understanding of latent and unexpressed customer needs (Slater & Narver, 1998). Another specific viewpoint from the market orientation is that relations with customers should be managed, in order to continuously assess their needs and wants, which is known as *customer relationship management*. Managing these relationships imply that relationship management should not be limited to sales and service contacts, but must include the involvement of the customer in new product or service development (Deshpande et al., 1993; Gouillart & Sturdivant, 1994; Johansson & Nonaka, 1987; Lagrosen, 2005; Michel et al., 2008; Ritter & Walter, 2003; Tushman & O'Reilly, 1996). Involving customers in product or service development not only leads to products or services that are really needed and appreciated, but also lead to a lasting relationship or increased loyalty from the participating customers (Comer & Zirger, 1997; Ennew & Binks, 1996; Friesen, 2001; Prahalad & Ramaswamy, 2004).

That customer-producer interaction is an important component in successful innovation is illustrated by a study from Rothwell and Gardiner (1983), which shows the pattern of active collaboration between textile machinery companies and external organizations during the development of twenty five commercially successful innovations. Of these companies 84 per cent enjoyed external collaboration during development, of which 66

per cent was with potential customers. Moreover, a number of companies interacted across several stages of the project and with several different outside agencies. It must be emphasized that in all cases, including those involving the user, the interaction involved much more than simply consultation; in each case the user was an active participant in the actual development of the machine (Rothwell & Gardiner, 1983).

The factors and practices of an organization that contribute to developing a market orientation are analyzed by Narver and Slater (1990), Kohli and Jaworski (1990), and Ruekert (1992). To be market driven or customer-oriented, companies need to manage their perhaps most precious resource: the knowledge *residing in* their customers, as opposed to knowledge *about* their customers (Davenport et al., 2001; Olson et al., 2008). By managing this knowledge of their customers, corporations are more likely to sense emerging market opportunities before their competitors, to constructively challenge the established wisdom of 'doing things around here', and to more rapidly create economic value for the corporation, its share holders, and last but not least, its customers (Gibbert et al., 2002). An organization's absorptive capacity will depend on the absorptive capacities of its individual members. The firm's absorptive capacity then depends on the individual who stand at the interface of either the firm and the external environment or at the interface between subunits within the firm (Cohen & Levinthal, 1990). Although Cohen and Levinthal refer mostly to technological or R&D knowledge, absorptive capacity may also be applicable to knowledge of and about customers and the market. Thus, all employees that have contact with customers contribute in the absorptive capacity of the company. This requires that customer knowledge should be sought through direct interaction with customers, in addition to seeking knowledge from sales representatives and such. So, market orientation and an Open Innovation approach seem to be conditions for customer co-creation in innovations, where market orientation pre-supposes an active interaction with customers.

#### **4.4.2 Success of Customer Co-Creation in Innovations**

R&D collaborations with customers can provide the firm with broad knowledge, supporting product innovation. Customers have knowledge about their unfulfilled preferences and needs, presenting opportunities to create innovations. Listening to customers helps firms better understand their needs (Christensen & Bower, 1996; Danneels, 2003;2004). Listening to customers is referred to as letting in the Voice of the Customer (Griffin & Hauser, 1993). Interaction with customers can improve firms' understanding of their needs and can help avoid wasting time and making costly changes in orders later in the product development process (Koufteros et al., 2005; Leonard, 1999). Cohen, Nelson and Walsh (2002) found that 90% of firms they studied indicated that knowledge provided by customers contributed to the initiation of the firm's new R&D projects. In addition to collaborating with customers to identify their needs and preferences, these R&D collaborations can be useful for identifying ways to fulfill these needs and wishes.

Un et al. (2010) study the benefits and effects of R&D collaborations. They conclude that companies should be careful when selecting the partners with whom they collaborate. Collaborating with suppliers provides the biggest boost to product innovation. Surprisingly, collaborating with customers didn't seem to have an effect on product innovation. A study by Gemünden et al. (1996) shows that customer-orientation with customer involvement in NPD and university interaction lead to highly innovative products, especially in high-tech industries. Huizenga (2001) comes to the finding that customer and supplier involvement in ICT innovations are both negatively correlated with the innovation portfolio success, but positively with innovation quality. Un et al.'s study also showed that working with competitors could actually slow down the innovation processes. They assert that successful product innovation partnerships depend on 2 dimensions of knowledge brought to the table by collaborators: the breadth of knowledge

and the ease of access to that knowledge. A broad knowledge base should provide a wealth of opportunities to combine ideas from different disciplines and diverse perspectives. Thus, universities and customers should make good partners. The notion of involving a diverse or heterogeneous set of customers to obtain broad knowledge is supported by a study from Bonner and Walker (2004). On the other hand, that knowledge needs to be accessible in order for the research to bear fruit. So suppliers and universities should make the better partners. It turns out that ease of knowledge access appears to be a stronger driver of success for R&D collaboration than breadth of knowledge. Collaborations with customers, who represent a wide breadth of knowledge but low ease of knowledge access, had no influence on innovation in this study. This 'indifference' of innovation sourcing may be due to the nature of these collaborations, where the firm and its customers discuss how to improve current products and, as a result, limit the exploration of new possibilities (Flores, 1993).

Accessing knowledge from customers to innovate products is difficult for a number of reasons. First, there is the challenge of obtaining tacit and complex knowledge from customers. Customers have deep-seated needs and preferences that may not be apparent even to them, but that are acted upon when they purchase products. The company that wants to create innovations that satisfy these needs and preferences must first identify them. To do so, it must make these needs and preferences explicit in order to create products that satisfy them. However, converting tacit knowledge into explicit knowledge is difficult (Nonaka & Takeuchi, 1995; von Hippel, 1994), since people know more than they can articulate (Leonard & Sensiper, 1998). Second, there is the challenge of obtaining tacit knowledge across organizational boundaries. Obtaining knowledge is difficult even within the firm, where employees require incentives and must have the necessary mindset to facilitate such transfer (Szulanski, 1995). The customers are not part of the firm and thus have neither the incentive to provide the firm with their knowledge nor the mindset necessary to interact with people in the firm. Finally, a tight linkage with customers may even be detrimental to the firm because it restricts the exploration of alternatives (Danneels, 2003).

"Even though customers potentially have lots of knowledge that could be useful for product innovation, it's very hard to get knowledge from them," says Un. "If you can establish mechanisms to draw out their knowledge and ideas – what they want – that could be very useful for product innovation" (Yu, 2008:9).

Callahan and Lasry (2004) investigated likeliness for customer input to the success of really novel, say radical and disruptive innovations, and found that the importance of customer input increases with product newness to a certain level and then decreases for very new products. Specifically, this finding seems to be relevant for the technical development of the product, where customer input was unlikely for high levels of product newness. This is more or less confirmed by Leonard (1999) who found that although co-development projects were not exclusively suited for totally new technical systems, the opposite seem to apply: successful development of totally new systems required a high involvement of customers. Customer input during requirements definition, trials and testing, and product launch is more likely to happen when new products are developed, while during the idea generation product novelty does relate to the intensity of customer participation. These findings seem to correspond with Rothwell and Gardiner's (1985) idea that for radical innovations customer involvement could be counterproductive in the front end of the innovation.

For assessing what customer demands are, traditional market research is not enough or suited (Ogawa & Piller, 2006; Ulwick, 2005; Zaltman, 2003). Firms should therefore use more probing techniques like the outcome-driven method (Alam, 2006a; Ulwick, 2005) or in-depth interviewing (Mullins, 2007; Zaltman, 2003). Firms should also engage in a relationship with their customers, which consists of inviting them to participate in new

product or service development (Ahmed, 1998; Chesbrough, 2003; Rothwell & Gardiner, 1983). This is beneficial to innovation success as well as to customer loyalty (Friesen, 2001; Prahalad & Ramaswamy, 2004). The latest known study investigating the effect of customer involvement in NPD is in the financial services field, confirming the positive effect of this involvement on the performance of the NPD process (Chien & Chen, 2010).

#### ***4.4.3 Benefits of customer co-creation in innovations***

Companies ask for a lot from their customers these days. In addition to purchasing products, customers may be expected to forgive negative experiences (Aaker et al., 2004), pay premium prices (Thomson et al., 2005), and make loyal purchases (Verhoef, 2003). Customers are encouraged to attend brand-centered events (McAlexander et al., 2002), participate in brand communities (Muniz Jr. & O'Guinn, 2001), and communicate with other customers of a brand (Kozinets, 2002). Companies ask their customers to spread word of mouth (Brown et al., 2005; Jones et al., 2007), participate in research (Aggarwal, 2004), volunteer time (Fisher & Ackerman, 1998; Sargeant & Lee, 2004), and donate money (Bendapudi et al., 1996; Brady et al., 2002). These desirable behaviors all help the company more than they benefit the customer (Johnson & Rapp, 2010). So, what do customers themselves benefit from helping out a firm? Is it reciprocation or are people plain altruistic<sup>12</sup> (Price et al., 1995)? Behavior is deemed "helping" only if the costs of the behavior exceed the benefits; that is, there is some sacrifice involved (Bendapudi et al., 1996). The marketing discipline appears to focus on consequences to the help recipient – behavior is deemed helping when it enhances the recipient's welfare. Price et al. (1995), however, look for the first time at market helpers (instead of the recipients of assistance) and examines why they help – even though their focus is on why consumers help other consumers. They propose three possible antecedents of market helping behaviors: marketplace involvement, altruism, and collectivist consumer tendencies. Their results suggest an important role for marketplace involvement and altruism, where the relationship to marketplace involvement is stronger than the relationship with altruism. Marketplace involvement is thereby defined as an individual difference variable representing the arousal potential of marketplace activities that cause personal relevance; it is a route to self-expression and a vehicle for projecting a person's self-concept (Price et al., 1985).

But it is unlikely that these mechanisms to help other people are also in place when people tend to help out organizations, but we can learn from this research that customers try to create a relationship with brands, where (1) relationships involve reciprocal exchange between active and interdependent relationship partners, i.e. the partners must collectively affect, define, and redefine the relationship; (2) relationships are purposive, involving at their core the provision of significant meanings to the persons who engage them at each level or depth of the operative goal connection; (3) relationships are multiplex phenomena: they range across several dimensions and take many forms, providing a range of possible benefits for their participants; and (4) relationships are process phenomena: they evolve and change over a series of interactions and in response to fluctuations in the contextual environment (Fournier, 1998). Benefits include psychosocial identity functions (e.g., reassurance of self-worth, announcement of image, and social integration) as well as the rewards of stimulation, security, guidance, nurturance, assistance, and social support; instrumental provisions are functionally tied to the attainment of objective, short-term goals (Weiss, 1974). Meaningful relationships are qualified not along symbolic versus functional product category lines, or in terms of high versus low involvement classes, but by the perceived

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<sup>12</sup> Altruism is defined as the intention to benefit others as an expression of internal values, regardless of social or motivational reinforcement (Price et al., 1995)

ego significance of the chosen brands that adds meaning to people's lives (Fournier, 1998).

From the perspective of the firm, customer co-creation offers information valuable in achieving ideal costs and time in production (Rothwell, 1994), and in reducing the uncertainty during the innovation process, such as those regarding the environment and user demands (Gales & Mansour-Cole, 1995; Leonard, 1999). Smedlund (2008) argues that customer co-creation is likely to result in high profit combined with a lower and shared risk of failure in the development process.

Customer co-creation in NPD or NSD can be important for decreasing development time (Alam, 2006a; Langerak et al., 1999; Leonard, 1999; Lewis, 1995; Millson et al., 1992; von Hippel, 1986); is especially useful in incremental innovation (Karagozoglu & Brown, 1993; Rothwell, 1994), and can improve the effectiveness of the product development process (Cooper & Kleinschmidt, 1986; Zirger & Maidique, 1990). Development time has become particularly important in development in order to secure competitive advantage (Clark & Fujimoto, 1991; Datar et al., 1996; Drew, 1995a; Lynn et al., 1999; Malhotra et al., 1996; Weggeman, 1997). Moreover, innovation speed<sup>13</sup> has been shown to be the most appropriate measure of success in highly competitive, and rapidly changing markets with short product life cycles (Blackburn, 1991; Kessler & Chakrabarti, 1996). By actively involving customers in an early stage in a continuous way the product development process may be accelerated (Bailetti & Guild, 1991). The contribution of customer co-creation in product innovation therefore cannot be ignored. Customers are an important source of information that can aid the product development process. Interaction with customers can improve understanding of their needs and can lead to avoidance of time consuming and costly change orders later in the product development process. On the other hand, customer integration can exhibit only a statistically moderate effect on quality (Koufteros et al., 2005). But, a recent study verifies that product co-development with customers directly improves product performance and product innovation (Lau et al., 2010).

Co-creating with the customer is also a great aid in establishing the optimum price/performance combination, which in turn helps establish the optimum design specification. Rothwell et al. (1974) in their study of UK textile machinery manufacturers and users, found a "notable mismatch in perception of importance weighting" of various general and specific product characteristics between these two groups. For example, they found that users were very much more aware of the importance of the total life-cycle costs than producers, who were more concerned with only one component of this, that of purchase price. In addition, users involved in the development process undergo a learning process that enables them to operate the new equipment more effectively when it is installed on a full commercial basis. Because of their accumulated experience, derived both before and after commercialization, such users can provide a strong demo effect for potential customers of the innovation. This can, in turn, accelerate the acceptance process for new designs (Gardiner & Rothwell, 1985; Leonard, 1999). The good relationships engendered through active user involvement in the formulation of the initial design brief may also result, if maintained, in a flow of user-initiated improvements. This may well extend the life-cycle of the innovative product or process (Conway, 1993; Gardiner & Rothwell, 1985).

Customer co-creation during NPD can be beneficial for two reasons: (1) quality of the product is improved by incorporating users' mental schemes (Boland, 1978) and their

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<sup>13</sup> Innovation speed is defined as the time elapsed between initial development and ultimate commercialization, which is the introduction into the marketplace (Kessler & Chakrabarti, 1996)

specialized needs and preferences (von Hippel, 1988); and (2) users are more receptive to a new system if they contribute to its design (Leonard, 1999; Salancik, 1977). Customer co-creation per se does not result in the realization of systems benefits. It is the accommodation of mutual needs identified during user involvement that is important (Leonard-Barton & Sinha, 1993). By actively involving potential users in the process of product development the manufacturer may (1) Develop a product that better fits user needs; (2) Shorten the duration of the total development project, and (3) Accelerate market acceptance of the product (Biemans, 1991). According to Anderson & Crocca (1993) technology providers can better understand user needs, and users can better understand the new technology in co-development projects. Designed products can better meet customers' preferences and needs when they are actively involved in product design and development (Franke & Piller, 2004). So, manufacturers have a great deal to gain from involving the user in the design and development process, both in its pre-launch phase (initial innovation) and its post-launch phase (re-innovation) (Gardiner & Rothwell, 1985).

The importance of the customer's role in the development of a service has been highlighted in the literature (Edvardsson et al., 2006; von Hippel, 1986; von Hippel, 1989; Zirger & Maidique, 1990). Such a role has been shown to be different from the one performed in the development of a tangible product (Johne & Storey, 1998; Martin et al., 1999). Whereas in product offerings, clients play a singular role – that of a customer – in services, clients play a dual role – that of customer and also that of co-producer of the offering (Athanasopoulou & John, 2004). This characteristic provides important arguments for actively involving customers in the development process. It can easily be argued in theory that if the customer influences the outcome and quality of service delivery, the customer should be a natural participant in the development process as it is in the development process where the prerequisites for the service are created (Edvardsson et al., 2006). In a study by Alam (2002), respondents were unanimous that the main motivation for customer involvement came from an ever-growing need for developing successful new services. Compared with manufacturing firms, service firms are likely to have greater contribution made to the innovation process by customers due to the inseparability of services – particularly labor intensive services like travel and hotels (Atuahene-Gima, 1996b). Service design practitioners therefore have developed special competencies, like integration of clients into the design process – which is especially relevant when designing services, since the clients in question are in any case already involved in production and delivery of the service (Saco & Goncalves, 2008). Other advantages for customer co-creation in new service development are: (1) New service with unique benefits and better values; (2) Reduced cycle time; (3) User education for new service; (4) Rapid diffusion and market acceptance (Alam, 2002); and (5) Long-term relationship improvement (Alam, 2002; Kelley, 1992). Users, actively involved in a service innovation process seem to produce more original and valuable proposals than professional developers (Magnusson, 2003), making it very tempting for service providers to opt more often for customer co-creation in new service development. Magnusson, Matthing et al. (2004) also found that customer co-creation reduces the innovation's cycle time. Chien and Chen (2010) discovered that customer co-creation is beneficial to cross-functional integration during the NPD process as well, because it confronts different departments that have differing viewpoints on the process or its outcomes with an independent party reducing controversy. Furthermore, customer co-creation can inspire the innovation process of the firm (Magnusson, 2003).

It has been claimed that customer participation is important in the development of new services that are either relatively complex, such as consultancy; or relatively long-lasting, such as certain types of banking; or both, such as life insurance (Ennew & Binks, 1996). Business-to-business markets have been identified as requiring extensive customer participation (Bitner et al., 1997; de Brentani, 1991; 1995). Customer participation has

been identified as particularly important for new service development (NSD) in rapidly changing markets in which communication can decrease uncertainty and mitigate risks (Akamavi et al., 1998a; Atuahene-Gima, 1996a; Drew, 1995b; Frambach et al., 1998; Mullins & Sutherland, 1998).

We have also seen that in the longer end customer co-creation is beneficial to customer loyalty towards product or brand (Akamavi, 2005; Alam, 2002; Ancarani & Shankar, 2003; Comer & Zirger, 1997; Ennew & Binks, 1996; Friesen, 2001; Gardiner & Rothwell, 1985; Nambisan & Nambisan, 2008). Mäkipää et al. (2006) found in their research that when seeking to increase customer loyalty and attracting new customers, companies need to increase customer involvement in research and design operations. Five factors are critical to the outcome of competition and collaboration in convergent industries: customer intimacy, degree of competition among different players in their focal markets, alliance formations, brand equity<sup>14</sup>, and execution. Customer intimacy is about who has access to and has built strong relationships with end customers. Firms with the deepest access and the strongest relationships with end customers are at an advantage in convergent industries (Ancarani & Shankar, 2003). But, literature in both business relationship (Gemünden et al., 1996; Håkansson, 1987) and NPD (Littler et al., 1995; Maidique & Zirger, 1985) fields emphasize the importance of relationship management as a precursor to an effective customer involvement in NPD (Ritter & Walter, 2003). Parkinson's (1985) study showed that the quality of this relationship is an important determinant of the rate of the adoption.

#### ***4.4.4 Innovation types suited for customer co-creation***

Customer co-creation in innovations is Open Innovation. As we have suggested in subsection 4.2 all kinds of object innovations – product, service or process – seem to be appropriate for involving customers in the innovation process. As we've seen previously, many studies have focused on customer involvement in product or service innovation. Fewer literature is available on customer co-creation specifically. Smedlund (2008) argues that the development of high-potential services follows a specific pattern regarding customer involvement: starting with the service provider getting an idea, experimenting without big involvement of the customer, moving into a phase with close involvement of customers and later on to a stage where the service can be further improved without big customer involvement. However, Huizenga (2001) also found in his study that customer involvement is highly correlated with all stages in process innovations, more than for product innovation. Hoonhout (2007) argues that when developing a next-generation of existing products, i.e. the incremental innovation, it is relatively easy to actively involve customers at the early stages of the process, e.g. by observing them during use and discussing with them what could be improved. Needs assessment for NPD is a systematic activity of gathering and clarifying customer needs, determining product characteristics based on the clarified need and ensuring that all important needs will be fulfilled (Karkkainen et al., 2001). Customers' needs must be clarified in the very early phases of product development. However, when creating novel products from scratch, customers might find it difficult to actively articulate future needs, to appreciate the potential and limitations of new technologies, or think about new applications. In addition, because of the complexity of technological innovations, potential customers have difficulties to appreciate the innovation's benefit, thus slowing adoption decisions (Anderson et al., 1987). So, customer co-creation in an early stage of a radical innovation does not seem to be effective. The importance of the input of end-users and other customers are affected differently by product newness. In particular, the

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<sup>14</sup> Brand equity is defined as a set of assets and liabilities linked to a brand that add to or subtract from the value of a product or service to a company and/or its customers (Aaker et al., 2000).



importance of end-user customer input decreases for very new products whereas the importance of other customer input does not (Callahan & Lasry, 2004).

On the other hand, firms that engage in R&D and that are attempting to introduce really novel level innovations, i.e. 'new to the market' rather than 'new to the firm' innovations—are much more likely to engage in co-operative arrangements for innovation, including customers (Tether, 2002). Active user involvement is particularly challenging when developing products that are radically novel (Trott, 2001). A focus should be put on capturing latent needs and customer knowledge. Customer solutions, however, should not be discarded as too original or unrealizable. Behind the solution, there might be an interesting yet unfulfilled need (Matthing et al., 2004). Perceptions are more likely to prevail than the logic of how products or services operate (de Bono, 1998). Other approaches to include the customers' perspective need to be considered, like – as suggested in sub-section 4.4.2– the outcome-driven approach (Ulwick, 2005) or metaphor-based in-depth interviews (Olson et al., 2008; Zaltman, 2003), in which participants actively co-create the insights on their needs and wants. Salomo et al. (2003) even assert that customers who are experts in the market, in the product category, or in the core technologies, are very well able to provide sufficient high quality information in the context of radical innovations. While information concerning needs can be supplied by customers *if* there is some sense of *who* the product is being developed for, new applications for emerging, often proprietary new technologies that are such a part of discontinuous innovations are not apt to come from customers (Veryzer Jr., 1998a); the real opportunities for obtaining customer input come during the prototype testing and commercialization phases of the NPD projects (Veryzer Jr., 1998b). However, from research we also learn that firms that develop radical innovation develop prototypes at an earlier stage than the typical, incremental NPD process (Veryzer Jr., 1998a), creating possibilities to actively involve customers during the implementation stage (prototyping, testing) (More, 1986) and commercialization stage of the innovation process. In this way customers also get educated in the new technology (Anderson et al., 1987). On the other hand, most breakthrough innovations require long-term development time – typically ten years or longer – and high investments (McDermott & O'Connor, 2002; Veryzer Jr., 1998a), reducing the chances for an efficient involvement of customers. Bonner and Walker (2004) show that the involvement of customers who have a close relationship with the firm – the existing and lead customers – usually leads to the development of incremental innovations because of the homogeneous nature of their needs, while potential customers with heterogeneous needs provide a diversity of perspectives, competencies and experiences that foster the development of radical innovations. Un et al. (2010), on the other hand, demonstrate that it is not the diversity in knowledge that affects the novelty of the innovation, but rather the ease of knowledge access. Although this apparent controversy has not yet been explained, we can find an explanation in the probability that existing customers are more likely to 'think and talk' like the firm, thereby unconsciously inhibiting effective communication of needs and knowledge, whereas customers in other markets or those that are not yet related to the firm tend to 'think and talk' differently, creating alternative paths to their knowledge which firms can access more easily. Furthermore, a systematic research on crowdsourcing literature (Geerts, 2009) shows that diversity in co-creating customers only is of importance during the so-called crowdcasting – a type of contest appealing on the crowd to submit their ideas or solutions for a specific problem – meaning that diversity and heterogeneity are important perquisites for customer co-creation in the conception stage of a radical innovation.

It is not our objective to prescribe a company whether it should develop radical or incremental, sustainable or disruptive innovation – as we have seen in the previous review the distinction is not always very clear. Neither do we want to discourage firms from developing technology driven innovations, without previously assessing customer

needs systematically. Our case, and therefore proposition, is that firms can always benefit from involving their customers in any kind of innovation at all, as long as the customers' knowledge can be accessed, and the aim of the innovation is that of fulfilling one or more needs or wants in the market. We will call this aim *market-centered* or *customer-centered* (Edvardsson et al., 2006). This means that ordinary customers' participation is likely to succeed for incremental and sustaining innovations, while participation in radical and disruptive innovations requires the application of a tool or method to get access to customers' knowledge.

#### **4.4.5 Tools and techniques to support co-creation**

In a study for her master's thesis van Daelen (2005) identified 29 tools that can be used in the customer co-creation approach. In addition, this study led to the identification of five criteria (customer contribution, reliability, speed, usability and inexpensiveness) based on which tools can be evaluated. She used a five phase model, consisting of idea generation, development, concept development, testing, and commercialization. A Delphi study (Linstone & Turoff, 2002) was conducted in order to determine the relative importance of the identified evaluation criteria and to identify, for every phase in the innovation process, which tools are best suited to support customer co-creation. In summary, according to the experts, customer contribution seems to be relatively important in all innovation phases, especially for idea generation, concept development and testing.

"However, note that the in comparison to other phases low relative importance of customer contribution for development and commercialization could be influenced by the Dutch background of the experts. This is because enabling customers to contribute in the form of 'creation' during development and commercialization is not yet a very common practice in the Netherlands" (van Daelen, 2005:69).

We refer to Appendix C for an overview of the tools.

Furthermore, several authors have, based on practice, developed new tools and methods that are especially intended to be used in the co-creation process. Some will be discussed here. In most cases these tools are derivatives of existing tools or hybrids of existing and new methods. All these tools and techniques are not interchangeable or choice is not arbitrary – the appropriateness depends on the purpose for which they are used and the innovation strategy of the company. For NSD the application of tools is situational and depends on the type of service design project, the resources available, and the objectives (Saco & Goncalves, 2008).

In one study, input for NSD was mainly acquired through periodic meetings between customers and the NSD team, customer observation and occasional in-depth interviews at various stages of the NSD-process (Alam & Perry, 2002). During these meetings customers performed several activities that were relevant to NSD. Alam's study (2002;2006b) mentions six modes of involvement, used by the studied companies:

- Face-to-face interviews, in-depth to gather needs, wants, preferences, likes, dislikes, gaps in the market, competition's offerings, desired improvement, timeliness of service delivery, service acceptance criteria.
- User visit and meetings
- Brainstorming or other group creativity techniques
- Users' observation and feedback, where users observe several NSD activities and results, and comment on them

- Phone, fax, e-mail
- Focus group discussions

The first 2 were the most dominant modes of user involvement because they were easier and inexpensive modes. In contrast, focus groups were least preferred because they were considered to be both expensive and time-consuming (getting everyone at the same time and place). Brainstorming was conducted only at idea generation and screening stages, while users' observations were used only at personnel training and commercialization stages. Phone, fax/e-mail was also least preferred, and only used at strategic planning and business analysis stages. According to Zaltman (2003) most new products are developed and launched using techniques like focus groups and questionnaires. And about 60% of all new products fail.

Maguire et al. (2007) identify some tools for 'listening to the customer', i.e. which are suited to be used for interactions with the customers in order to try and gain a comprehensive understanding of their customers, and to identify customer service attributes for improvement. Ten key listening tools emerged from their study. Many of these tools are specific tools that are fit for specific objectives under prescribed conditions. It can be noted that four listening tools are survey-based. All the companies emphasized that a deep understanding of their customer is a source of competitive advantage. Thus, large companies go beyond surveys. They engage in a dialogue with customers at every opportunity and ensure that the insights that are captured are used in decision making at all levels of the organization (Lundkvist & Yakhlef, 2004). Confirmation from different customer listening tools could provide managers with more confidence and provide a better understanding of customer perception and decision making. The study therefore reveals that qualitative tools can be used before and after quantitative listening tools to add understanding and gain an insight into customers. These qualitative methods encompassed customer complaints, customer visits, focus groups, face-to-face interviews and observation. The focus group seemed to be the type of listening tool that fits the initial product/service development cycle, where ideas and input from customers are sought in testing new product/service. The authors regard this as the most proactive listening tool amongst the rest because early detections of errors or potential future customer dissatisfaction could be eliminated at this stage through revising the new product/service.

Dahan and Hauser (2002) review six web based methods of customer input in NPD, which they call the 'virtual customer'. Some of these methods are simply a transfer of paper and pencil or central-location interviewing methods to the web. Others exploit the new communications and computing power to provide capabilities that were not feasible previously. In some applications, the authors believe that the virtual customer methods will replace existing methods, but in most instances they will complement existing methods for expanded capabilities. The tools reviewed are demonstrated on the MIT-website ([mitsloan.mit.edu/vc](http://mitsloan.mit.edu/vc)). They also observe that most virtual customer tools are consumer oriented, and in a lesser way suited for B2B customer involvement. They conclude with the remark that while these online methods can be used at every stage of the NPD-process not every method will be used at every stage.

Kaulio (1998) presents seven different methods for customer involvement in product development. Different methods support the involvement at different phases. Moreover, different methods support the involvement in different ways. The seven different methods are: (1) quality function deployment (QFD) (Griffin & Hauser, 1993); (2) user-oriented product development (Dahlman, 1986); (3) concept testing (Acito & Hustad, 1981; Moore, 1982; Page & Rosenbaum, 1992); (4) beta testing (Dolan & Matthews, 1993); (5) consumer idealized design (Ciccantelli & Magidson, 1993); (6) lead user method (Herstatt & von Hippel, 1992; Urban & von Hippel, 1988); and (7) participatory

ergonomics (Noro & Imada, 1991). We will elaborate on some these methods in the appropriate review of specific stage tools. But we can already conclude that not all of these tools are appropriate to support the customer co-creation because of their derivation from traditional market research tools; to support customer co-creation interaction and active participation will prove to be necessary..

## 4.5 Modes of customer co-creation

Many researchers have pointed out that the concept of the value chain will be replaced by the value innovation system of the value constellation and the value network and also emphasized that customers may be involved in the value innovation system to create a dependent relationship better than the past relationships (Friesen, 2001; Kambil et al., 1999; Normann & Ramirez, 1993; Prahalad & Ramaswamy, 2000; Prahalad & Ramaswamy, 2002; Ramírez, 1999; Sawhney & Prandelli, 2000; Vargo & Lusch, 2004). For example, Value Constellation proposed by Normann & Ramirez (1993), Value Co-production proposed by Ramirez (1999), Co-creation of Prahalad & Ramaswamy (2002); Kambil, et al. (1999); Friesen (2001) and Sawhney & Prandelli, (2000), Customer as Innovator proposed by Thomke & von Hippel (2002), the service-dominant logic for marketing<sup>15</sup> from Vargo and Lusch (2004), and the Customer Capital Theory proposed by Stewart (1997). All these theories also mention the more and more vague borderlines of manufacturers' organization and the overlapping borderlines between suppliers and customers (Chan & Lee, 2004).

Following the seminal studies from von Hippel, new product scholars and practitioners have proposed a range of successful techniques for obtaining customer input into product development processes, such as lead user analysis (Herstatt & von Hippel, 1992), mass customization (Berger et al., 2005), information acceleration (Urban et al., 1997), beta testing (Dolan & Matthews, 1993), consumer idealized design (Ciccantelli & Magidson, 1993), quality function deployment (Griffin, 1992), the ideal oriented co-design (Albinsson & Forsgren, 2004a), participatory design (Greenbaum & Kyng, 1991) and user communities (Chan & Lee, 2004). In the remainder of this chapter we will briefly but systematically review some of the ways, in which firms can involve their (potential) customers for innovation. The modes vary in different ways: from passive to active involvement, from just one process phase to many phases, from physical, online to both off- and online involvement, and from manufacturer-controlled to customer-controlled or initiated. By providing this short review we get acquainted with the increasing role of customers in value creation in contemporary society. The order in which we do this is of increasing activity from the participating customers, and an increasing external locus of customers' contributions. Customers' contributions can be active (work, expertise, or information) or passive and even unknowing, e.g. behavioral data that is gathered automatically during a transaction or an activity. By activity locus we refer to where the actor, which is in control of the activities, resides. This can be within the innovating firm, on its boundaries, or even outside its boundaries, denoting the increasing autonomy that users and customers have in the activities. Finally, it is necessary to mention that several of the described modes go beyond mere customer co-creation in innovations and have the intention to facilitate other collaboration activities from customers as well (e.g. mass customization, user generated content, open source and crowdsourcing).

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<sup>15</sup> The service-dominant logic of marketing implies that service provision rather than goods is fundamental to economic exchange – value is defined by and co-created with the customer rather than embedded in output.

## 4.6 Market research

### 4.6.1 Definition of market research

To have a market orientation when innovating, one of the means would be to understand what customers want. In other words, the organization should be consumer oriented and should try to understand consumers' requirements and satisfy them quickly and efficiently, in ways that are beneficial to both the consumer and the organization. This means that any research organization should try to obtain information on consumer needs and gather marketing intelligence to help satisfy these needs efficiently (Aaker et al., 2000). The systematically executed activity of discovering what people in product and services markets want, need, believe, or even how they act is called market research (Willems et al., 1988). In addition to that, the activity of researching in what way companies really meet these customers' wishes and needs, for instance, compared to their competitors, is also called market research (Gelderman & van Goor, 1993). Market information refers to information describing the market, covering a broad array of issues, including the dominant economic characteristics of an industry, factors determining competitive success, industry prospects for profitability, customer information, that might be fed into a firm from a variety of sources, both internal and external (Hart et al., 1999).

Customer input is inadvertently needed for market research and can therefore be qualified as a way of involving customers in the company's processes. Many companies perform market research to support marketing decisions (Aaker et al., 2000). They either do that themselves, but most of them outsource the research to external, specialized market research firms, where companies limit themselves to the interpretation and evaluation for practical implications of the research results (Gelderman & van Goor, 1993).

There has been - and still is - a lot of academic discussion on whether market research can be qualified as delivering reliable, validated, and accurate data of markets, users and consumers, and therefore making it a scientific method, containing the necessary rigor and proof that is required by theory, especially when the qualitative research techniques are concerned (Aaker et al., 2000; de Ruyter & Scholl, 2004; Gummesson, 2004). Nevertheless, judging by the still increasing application of market research, we can state that for innovation management market research has much practical value. In the past 20 years many improvements in traditional market research have been made, due to advances in electronic capture of information, new statistical procedures, and in greater computational capacity (Zaltman & Coulter, 1995). Especially advances in methods providing deeper understanding about users' latent and emerging needs have been made (Aaker et al., 2000).

### 4.6.2 Market research for innovation purposes

Market research is a typical means to acquire insight into customers' needs and wants. It is the approach for the so called *needs assessment* in innovations (Cooper, 1999; Griffin & Hauser, 1993; Holt, 1987; Holt et al., 1984). Firms can achieve and sustain a competitive advantage through the creative use of market information (Aaker et al., 2000). But traditional approaches seem to impede progress in the case of development of breakthrough products (Herstatt, 2002; Lynn et al., 1996): their results can prove misleading when uncertainty exists concerning the nature of the technological platform, who the customer is, what the product will look like, etc., because these approaches operate under the assumption that the customer has historical experience with similar products. It is because of these limitations that *hybrid* techniques like the Lead User Approach (Urban & von Hippel, 1988), Information Acceleration (Urban et al., 1997), Empathic Design (Leonard & Rayport, 1997), Customer Immersion (Campanelli, 1993),

and Zaltman Metaphor Elicitation Technique (Zaltman, 2000) have been developed. The Zaltman Metaphor Elicitation Technique (ZMET™) is one of the most popular and recent combination of *projective* techniques that focuses on surfacing deep metaphors because they are a key link to unconscious thoughts (Arnould & Epp, 2006).

Although market research has almost always been an essential means for firms to acquire insights in customers' needs and requirements we see market research applied to other stages of the product or service development process as well. Based on these explicit made needs, the product development starts with an exploration for new product ideas and is followed in many cases by the concept test, where the market research supplies information that will hopefully decrease the chance on failure in later development stages (Gelderman & van Goor, 1993). In the concept test - where the concept is a precise description or representation of the new product (Acito & Hustad, 1981; Page & Rosenbaum, 1992), which explains what it is, what its features are and what benefits users get – product developers can test acceptance for the new product. In one particular study it had been observed that concept tests were noticeably absent in NPD-activities (Cooper & Kleinschmidt, 1986). The launch or commercialization of the new product can be tested with a product test – the testing of a complete product in the way it is going to be introduced in the market. Firms can then test customers' reaction on physical features, packing, brand and brand naming, service and complaint handling, in order to get an estimate of probable turnover, sales, or even market share with the new product. The voice of the customer is thus incorporated throughout the development process, from ideation and strategy stages onward (Lynn et al., 1996) on a continuous basis (Feldman & Page, 1984). As a result, more than one method will be required in order to ensure that the input is available in a useful form at the various stages.

An example of a focused market research (and marketing) methodology is Collective Customer Commitment (Ogawa & Piller, 2006), a simple method to decrease the flop rate of new products, benefiting from integrating customers in the innovation process. The process starts when an idea for a product is posted on a dedicated web site by either a (potential) customer or the developers of a manufacturer. Secondly, reactions and evaluations of other consumers towards the posted idea are encouraged in form of internet forums and opinion polls. Based on the results of this process, the manufacturer investigates the possibility of commercialization of the most popular designs. Is this evaluation positive, the company decides about a minimum amount of purchasers necessary to produce the item for a given sales price, covering its initial development and manufacturing costs (and the desired margin). The new product idea is then presented to the customer community, and interested customers are invited to express their commitment to this idea by voting for the design or even placing an order. Accordingly, only if the number of interested purchasers exceeds the minimum necessary lot size, investments in final product development are made, merchandising is settled and sales are commenced.

#### ***4.6.3 Increasing role for an active customer***

In many market research techniques, particularly the quantitative ones, like surveys, the customer or participant has no or little control over the interpretation and use of his input. Participants are passive and undergo the research process, with little knowledge about why things are being asked and what is done with their answers. These systems, however, are based on an indirect understanding of what customers want (Davenport et al., 2006). Firms must realize they can't just collect data. The data has to translate into something meaningful about existing or potential customers (Aaker et al., 2000). This requires mixing transaction and human data. Firms then have to think creatively about the acquisition of human data. Many techniques can be used: customer forums, monitoring customer service calls, having all employees use the company's products so they know firsthand what customers are talking about (Davenport et al.,

2001). Another approach is through depth interviews. Depth interviews facilitate a high degree of psychological depth, that is, investigations of informants' life world, identity, motivations, and desires and their associations with market offerings (Thompson, 1997;2003; Thompson et al., 1990).

Also, we see that in the last decade this research has shifted from a passive involvement of customers and consumers – which is commonly referred to as 'traditional market research' in many studies – into a more active participation (Davenport et al., 2006; Kozinets, 1999; Prahalad & Ramaswamy, 2003; Senge et al., 2001). This active participation usually takes place in a direct conversation between customer and firm representatives (Flores, 1993; Lundkvist & Yakhlef, 2004), preferably by or in the presence of those that are directly involved in product or service development (Tomes et al., 1996). A very well known example of this active participation is the development of the Boeing 777 (Condit, 1994). This direct conversation can be conducted either physically, e.g. qualitative customer interviews (Buber et al., 2004; de Ruyter & Scholl, 2004), or online (Del Rey, 2008; Kozinets, 1999;2002). Owing to the present Internet capabilities of Web 2.0., such as social networks, weblogs and wikis, customer participation becomes even more active, not to say proactive; the rise of these technologies give way for people to express themselves in all possible ways, thereby exposing their needs, wants, feelings and thoughts, which are indispensable for NPD (Antikainen et al., 2006; Bonabeau, 2009; Li & Bernoff, 2008). Online social networks are no substitute for face-to-face interactions. Their strength lies in allowing companies to collect information about the network they already have (Kozinets, 2002; Powell, 2009). Market research to elicit customers' needs and wants has thereby gone beyond the traditional form of companies asking questions and customers answering them, resulting in an actual dialogue between companies and customers. However, real customer co-creation in innovation goes beyond market research, contrary to what some authors posit (Sandén, 2007).

A vast majority of online marketing research efforts, however, still represent a migration of more traditional research activities, such as concept and product testing, advertising and brand tracking, customer satisfaction measurement, and qualitative research (Miller, 2006). But today's online researcher is often not interested in migrating traditional research methods to the online medium. Instead, they are looking to take advantage of the interactive nature afforded by the online environment to conduct studies that might have been difficult, if not impossible, to conduct in the offline environment, such as virtual and simulated shopping environments, interactive product configurators, full screen, full motion stimulus exposure (commercials, TV programs, online ads, etc.), and online communities of hundreds and thousands of 'advisors'. Online methods reduce time and costs of completing studies. On top of that, they are more versatile and produce 'better' data than traditional methods such as face-to-face, telephone, mail, and mall surveys (Miller, 2006). However, technology, security and ethics can pose issues, while respondents could fail to show up for a research, or even depart prematurely, because the moderator has no control. An online research technique that adapts ethnographic research techniques to study cultures and communities that are emerging through computer-mediated communications is Kozinets' netnography (Kozinets, 2002).

## **4.7 Empathic, user-centered and co-design**

### ***4.7.1 Distinguishing design for, with and by customers***

Initially conceived in information systems development, but finding application in other sectors as well, numerous techniques are being deployed to involve users in the design and development of products. Beginning in the 1960s, the practitioner and researcher communities considered user participation in the development of information systems

(IS) applications to be critical to IS implementation. Since that time, researchers have studied user participation, convinced of its influence on such key criteria as systems quality, user satisfaction, and systems use (Barki & Hartwick, 1994; Ives & Olson, 1984; McKeen et al., 1994). User participation is then defined as "the extent to which users or their representatives carry out assignments and perform various activities and behaviors during the system development process (Hartwick & Barki, 2001:21)", while satisfaction refers to the extent in which the user is satisfied with the result, the new system (McKeen et al., 1994). The user participation usually entails active participation in requirements specification and design through user *experience design* (Norman, 1999), *empathic design* (Leonard & Rayport, 1997), *user centered design* (Beyer & Holtzblatt, 1998; Greenbaum & Kyng, 1991) and *co-design* (Albinsson & Forsgren, 2004a).

#### **4.7.2 User experience design**

*User experience design* is a subset of the field of experience design which pertains to the creation of the architecture and interaction models which impact a user's perception of a device or system, and has evolved as a reaction on technology-centric design (Sisler & Titta, 2001). The scope of the field is directed at affecting all aspects of the user's interaction with the product: how it is perceived, learned, and used (Norman, 1999). This field has its roots in human factors and ergonomics, a field that since the late 1940s has been focusing on the interaction between human users, machines and the contextual environments to design systems that address the user's experience. The term also has a more recent connection to user-centered design principles and also incorporates elements from similar user-centered design fields. At its core user experience design incorporates most or all of the related disciplines to positively impact the overall user experience with a particular system or device. For services we speak of *experiential services*, where the focus is on the experience customers are having when interacting with the company, rather than just the functional benefits (Voss & Zomerdijs, 2007). Innovation is particularly important for this kind of services, as one of the key features of successful experiences is considered to be continuous renewal or refreshment of the experience to keep exceeding customer expectations. User experience design defines a sequence of screen presentations, user interactions, and system responses that meet user goals and tasks while satisfying business and functional requirements. Typical outputs include wireframes (screen blueprints or storyboards), prototypes, and written specifications that describe the design, of which each can be submitted to end users to elicit the effect on their experience (Sisler & Titta, 2001).

#### **4.7.3 Empathic design**

*Empathic design* is an approach to design where researchers or developers try to get closer to the lives and experiences of (putative, potential or future) end-users, and to apply what they learn together with end-users in the design process. The goal of empathic design is to ensure that the product or service designed meets end-users' needs and is usable. Customers' ability to guide the development of new products and services is limited by their experience and their ability to imagine and describe possible innovations because of their *functional fixedness* (Adamson, 1952). A set of techniques that are founded on observation (Aaker et al., 2000; Arnould & Epp, 2006) — watching consumers use products or services — can help resolve those dilemmas. But unlike in focus groups, usability laboratories, and other contexts of traditional market research, such observation is conducted in the customer's own environment — in the course of normal, everyday routines (Schouten & McAlexander, 1995). In such a context, researchers can gain access to a host of information that is not accessible through other observation-oriented research methods. Market researchers generally use text or numbers to spark ideas for new products, but empathic designers use visual information as well. Traditional researchers are generally trained to gather data in relative isolation



from other disciplines; empathic design demands creative interactions among members of an interdisciplinary team (Leonard & Rayport, 1997).

The major problem associated with empathic design is that people tend to act differently when they are aware they are being observed. This is combated by observers remaining for as long a period of time as necessary for subjects to become comfortable with the idea of being watched and thus, to act naturally. An example of empathic design in the Netherlands can be found in the Restaurant of the Future, a collaboration of the Wageningen University, Sodexho, Noldus and Kampri, where measurement of food selection and consumption takes place when and where it occurs by observing of consumers in a naturalistic context (Noldus, 2007).

#### **4.7.4 User-centered design**

In broad terms, *user-centered design* (UCD) is a design philosophy and a process in which the needs, wants, and limitations of the end user of an interface or document are given extensive attention at each stage of the design process. User-centered design can be characterized as a multi-stage problem solving process that not only requires designers to analyze and foresee how users are likely to use an interface, but to test the validity of their assumptions with regards to user behavior in real world tests with actual users. Such testing is necessary as it is often very difficult for the designers of an interface to understand intuitively what a first-time user of their design experiences, and what each user's learning curve may look like.

Jordan and Persson (2007) provide us with an evolutionary overview of user-centered design, which we will present in an abbreviated manner, with some observations of our own. Over recent years user-centered design has evolved from a perspective that was predominantly usability-based to a wider approach that encompasses issues such as emotion and pleasure (Jordan, 2002) and future experiences (Sanders & Stappers, 2008). These approaches look not only at the practical and functional aspects of user – product interaction, but also at a variety of emotional and other variables which contribute to the overall experience of product use and ownership. These approaches often referred to as affective or 'pleasure-based', have gained considerable ground over the last five years. Many design and human factors conferences are dedicated to the subject, there is a burgeoning literature on the topic and, perhaps most significantly, companies have spent vast amounts of money integrating these approaches into their product creation processes. With these approaches has come an enhanced understanding of users and user requirements. Where previously the focus was almost exclusively on understanding people from a physical and physiological perspective, there is now equal emphasis on understanding their values and aspirations, the social context in which they use products and the emotional reactions that they hope to receive from product use. There has also become a wider appreciation of the role of products in people's lives— the idea that a product is not merely a functional or decorative item but an integral part of people's lifestyles. The products and services that people purchase and use are often seen as being a way in which people define themselves, with the emotional qualities of these products representing the aspirations of their users and owners. This, in turn, has led to the need for a far wider and deeper understanding of people. Previously there had been an emphasis on looking at people in narrow terms, in particular as 'users' or 'consumers'. Now, however, it is understood that a holistic understanding of people can form the basis for a better informed design requirements specification—one that not only looks at the practical aspects of product usage, but also at the wider pleasure that is gained from use and ownership. Holistic approaches to understanding users give a far richer picture of the person – product interaction. Rather than thinking of the product simply as a 'tool' which is used to do a task, it becomes a 'living object' with which the user has a 'relationship' (Marzano, 2007). However, it may also be the case that the nature of the relationship between people and products may vary significantly depending

on a number of factors, including the nature of the product and the role that the product plays in a person's life.

There are three forms of user-centered design: (1) *Cooperative design*, also known as *Collective Resource Approach*, that entail the involvement of designers and users on an equal footing, and is rooted in the Scandinavian tradition of design of IT artifacts that has been evolving since 1970 (Greenbaum & Kyng, 1991); (2) *Participatory design* (PD), a North American term for the same concept, inspired by Cooperative Design, focusing on the participation of users; and (3) *Contextual design*, "customer centered design" in the actual context, including some ideas from participatory design (Beyer & Holtzblatt, 1998).

### **Collective Resource Approach**

The Collective Resource Approach (Ehn & Kyng, 1987) to systems development recognizes the importance of perspective, interests, conflict, and participation among multiple expertise standpoints in the design process. Technology is not neutral, it benefits people disproportionately. Adverse consequences are usually ignored when those who would be affected are not included in the process. Three reasons why users should participate in system development that are usually given in this approach are (1) improving the knowledge upon which systems are built, (2) enabling people to develop realistic expectations, and reducing resistance to change, and (3) increasing workplace democracy by giving the members of an organization the right to participate in decisions that are likely to affect their work (Bjerknes & Bratteteig, 1995; Bjørn-Andersen & Hedberg, 1977; Bosman, 2005). It is obvious that this approach is aimed at developing IS for businesses or firms, where 'users' are usually the employees of the receiving company that interact with the system on a daily basis (Bosman, 2005; Land & Hirschheim, 1983).

### **Participatory Design**

*Participatory design* is an approach to design that attempts to actively involve the end users in the design process to help ensure that the product designed meets their needs and is usable (Dindler & Iversen, 2007). As computer systems become more complex, business emphasize more on quality, productivity, traditional water flow lifecycle methodologies can not satisfy these trends. So the collaborative and participatory development model gained visibility in the mid-1960s, when the early users of time-shared computers realized that collaboration often produced unexpected benefits (Tuomi, 2002). Joint Application Development (JAD) and Participatory Design (PD) methods were proposed in order to address the problem. These two methods both emphasize greater user involvement and user participation in the development of systems. JAD was originally adopted in North America, while PD in Scandinavia. There are many similarities between JAD and PD. However, JAD and PD have different goals, JAD emphasizes on the functional requirements of the system, PD emphasizes more on social aspects of the system (Damian et al., 1999). It is obvious that this approach is focused on process and not a design style – it appeals to user empowerment and democratization, while designers have to learn to delegate design responsibility and innovation to users (Sanders & Stappers, 2008). Within the PD approach several design techniques have been developed as means of conducting inquiries with users, like games, sittings, workshops, storytelling, photos, dramas, prototypes and languages (Muller, 2001). One of these is the Fictional Inquiry (Dindler & Iversen, 2007), which consists of confronting users with a fictional challenge, and have participants play themselves and deploy actions and activities for an answer to the challenge. All interactions with the users are recorded by video, audio, transcripts, notes, etc. for analysis afterwards. In this analysis users can also play a role in assisting the interpretation process (Matthing et al., 2004). Aside from IT-systems development PD is also used in urban design, architecture, landscape architecture and planning as a way of creating environments that are more responsive

and appropriate to their inhabitants' and users' cultural, emotional, spiritual and practical needs. It is one approach to place making. In the United Kingdom it is known as community architecture. The scientific field of PD is extraordinarily diverse, drawing on fields such as user-centered design, graphic design, software engineering, architecture, public policy, psychology, anthropology, sociology, labor studies, communication studies, and political science (Muller, 2001).

## **Contextual Design**

*Contextual Design* (CD) is a user-centered design process that incorporates ethnographic methods for gathering data relevant to the product, field studies, rationalizing workflows, system and designing the human-computer interfaces (HCI). In practice this means that researchers' aggregate data from customers in the field, where people are living and applying these findings into a final product (Beyer & Holtzblatt, 1998). Contextual design has primarily been used for the design of computer information systems, including hardware (Curtis et al., 1999) and software (Rockwell, 1999). Parts of contextual design have been adapted for use as a usability evaluation method (McDonald et al., 2006). Contextual design has also been applied to the design of digital libraries and other learning technologies (Notess, 2004;2005). A more lightweight approach to contextual design has been developed by its originators to address an oft-heard criticism that the method is too labor-intensive or lengthy for some needs (Holtzblatt et al., 2005). Contextual Design provides a holistic view by helping designers to ground design in real work practice and offers tools for validating designs throughout the design processes (Notess, 2005). Another benefit is the richness of the data yielded by contextual inquiry. It allows designers to ask why users do something, right when they do it, in the place where they do it. Knowing users' motivations — the intents that drive their activities— is very important data for system designers (Notess, 2005). Yet others find the designer/user engagement promoted by contextual design to be too brief (Hartswood et al., 2002). Their paper calls for a re-specification of IT systems design and development practice as co-realization. Co-realization is an orientation to technology production that develops out of a principled synthesis of ethno-methodology and participatory design. It moves the locus of design and development activities into workplace settings where technologies will be used. Through examples drawn from case studies of IT projects, they show how co-realization, with its stress on design-in-use and the longitudinal involvement by IT professionals in the 'lived work' of users, helps to create uniquely adequate, accountable solutions to the problems of IT-organizational integration (Hartswood et al., 2002).

## **Relation with user involvement**

Empathic and contextual design can be seen as a move of researchers and developers into the world of end-users, whereas participatory design can be seen as a move of end-users into the world of researchers and developers, but altogether all aim at involving the user or customer in the design of the new product. But, in contrast to user innovation, the idea for the new product is something the supplying firm has already created – with the possibility that another user has initiated it. This typical feature of user-centered and empathic design and development implies that customer involvement does not necessarily have to be restricted to the same customer(s) throughout the whole innovation process.

### **4.7.5 Co-design**

The word '*co-design*' was first used as a philosophy in the American pragmatist tradition, which argues that all people have different ideals and perspectives and that any design process needs to deal with this. In co-design there is an understanding that all human artifacts are designed and with a purpose. In co-design one tries to include those perspectives that are related to the design in the process. It is generally recognized that

the quality of design increases if the stakeholders interests are considered in the design process, and therefore stresses the user's active role in the design process (Mattelmäki, 2008). Co-design is a development of the Systems Thinking<sup>16</sup> (Churchman, 1968), which according to C. West Churchman "begins when first you view the world through the eyes of another (Churchman, 1971). " A co-design situation is where the success is dependant on some collaboration between people with different interests, perspectives or cultures. Co-design is about making these people, interests and perspectives positive, constructive forces in the design process. The co-design approach suggests that there is no a priori, finite list of stakeholders, but rather the selection of stakeholders is part of the design process (Albinsson & Forsgren, 2004a; Albinsson et al., 2006). The approach also suggests that there is a need for a common Design Language. When inviting stakeholders to Co-Design something, the stakeholders need to be able to express their own ideas, thoughts and feelings, as well as being able to understand the others (Albinsson, 2005). Based on this perspective co-design is applied in many fields, for instance architecture, information systems and business. It has recently become popular in mobile phone development, where the two perspectives of hardware and software design are brought into a co-design process. Applied with the purpose of innovation some variants have been developed in hardware and software development, e.g. the ideal oriented scenario (Albinsson & Forsgren, 2004a) and the dramatized co-design scenario (Albinsson, 2005). The ideal orientation points at the use of people's ideals as a driving force in innovation, but acknowledges the problem that users can't initially state their requirements and will change their requirements during a project. The requirements problem has always been present in information systems development, but recent developments in IS use have dramatically increased its impact. With the arrival of the Internet, the focus of IS has changed from an employee or group of employees using a computer system performing a distinct task that they are employed to perform, to a situation where service providers are trying to develop IT-produced services that will be used by many very different groups for different purposes. There is little use in designing things without knowledge of those who are supposed to benefit from them, so co-design propagates getting to know and engage the most important stakeholders. Many of the users are outside of the organization in charge of the service and may even have conflicting interests with the service provider. It is only by having as clear an image as possible of these interests that one can hope to arrive at a design acceptable by all. Once the stakeholders are identified, they or representatives for them can be invited to participate in the rest of the design process. As the stakeholders may change their ideals during the process, it is necessary to maintain a close relationship during the project. Of course it is necessary to continuously monitor whether the list of stakeholders are relevant (Albinsson & Forsgren, 2004b). In many cases a stakeholder may not actually participate in the design process. In these cases the ability of the designer(s) to represent them is crucial. The ideal oriented co-design approach has been found to be rather successful in cases of the development of a sales support system for the Swedish company Volvo and another buy support system for IKEA (Albinsson & Forsgren, 2004b).

*Co-development* differs from PD (Participatory Design) or co-design because the users are not engaged in system design. The engineers develop the technology, but the users and engineers co-develop the change and extension of the users' work practice necessary to properly apply the system. Furthermore, in contrast to the published discussions of PD efforts, this project brings engineers employed in a large commercial technology company together with users and customers specifically to (a) evaluate this new technology and work practice and (b) explore market and product requirements. Co-

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<sup>16</sup> Systems Thinking focuses on how the object being syudied interacts with other constituents of the system – a set of elements that interact to produce behavior or action – of which it is part. Systems thinking is especially suited for the study of complex problems that involve many actors.

development also differs from Joint Application Design, which is another information systems (IS) design method, because developing new technology with the users changes the engineers' work practices. First, co-developing systems with customers was expected to shorten the time required to discover customer needs and produce products that satisfy them. Furthermore, co-developed products and systems are expected to be more reliable, to satisfy customer need, and to anticipate the needs that grow from extensions resulting from the customer's evolving work practice and business goals. Second, working collaboratively with customers is expected to improve the work life of engineers. Co-development of product prototypes (Brodersen et al., 2008) results in change to the work practices of both the customer and the engineers (Anderson & Crocca, 1993).

#### ***4.7.6 Co-design requires dialogue***

Each mode of customer involvement in design activities is supported by its own tools, which are usually applied in user group discussions and meetings, and face-to-face interviews with customers to get an adequate picture of the use context and personal experiences with system functionalities, failures or inadequacies. A particular problem is the language to express ideas in. If participating customers can't understand the language of design chosen, they can't contribute. Means to maintain a constructive and meaningful dialogue on the design are therefore of great importance. These apply to both languages of design as well as group methodologies. While many design professions have well established design languages, most of these require training and experience to be useful (Muller, 2001). Co-design, however, prefers to have as few prerequisites on the participating stakeholders as possible, and tries not to limit the participation to people of certain vocations. Metaphors and scenarios are two elements in a design language that meet these requirements (Albinsson, 2005). We elaborate on the first mentioned solution tool or technique in Appendix G and when developing propositions regarding the support of the customer involvement (see 9.5.2). As for scenarios, these have become a widely used tool for designing systems, services and products, and there are an increasing number of publications about scenario use. Scenarios can be used throughout the design process in various phases for example for understanding users' needs and their work, developing requirements (Carroll et al., 1998), creating ideas and communicating product concepts (Ylirisku, 2004). Scenarios allow keeping product details in the background while setting the focus on users' activities and contexts. Scenarios promote communicating the meaning of different designs by putting them in the use context including users, their motives and environment. A scenario can explain the purpose of the system, service or product in a brief, concise and engaging way. They are good for communicating causal relationships, because unlike for example drawings or mockups, scenarios describe events happening over time. This makes scenarios ideal for communicating the utilitarian functions of a product. Participatory video scenarios can be used to facilitate user participation in the development of collaborative information systems. At the same time these scenarios promote the empathic understanding of the users. When scenario design is based on a contextual study of the users' work, the scenarios can be focused on the issues that are most challenging from the users' point of view. The number of scenarios can be minimized and their future relevance maximized, when the scenarios are built on key findings abstracted from the users' work. Co-creating video scenarios in participation with users is at best both efficient and motivating. As users are experts in their field, they can relatively quickly come up with realistic and representative examples of situations for the scenarios. The richness and multimodality of video and the possibility to augment the story afterwards with edited images and sounds support communicating the scenario performances in a vivid, detailed and emotion-evoking way (Ylirisku, 2004).

An important insight that can be derived from all these reviewed modes of customer participation is that success is highly dependent on the direct dialogue between users and designers (Boland, 1978; Lundkvist & Yakhlef, 2004; Tomes et al., 1996). A typical

barrier to the adoption of user-centered, participatory, empathic, or co-design ironically arises from respect for customers and what one might think of as *customer protectionism*. In many organizations, information about customers is treated in the strictest confidence, considered for the eyes of the marketing and sales departments only, and contact with customers by the development team is very rare. However, while the information gathering activities of a user-centered design approach are similar to market research activities – e.g. focus groups, customer surveys, user interviews, the two have distinctly different goals and methods and must not be confused with each other. The goal of marketing research is to determine product viability, the goal of the customer inquiry methods of user-centered design is to plan for product usability and long-term customer satisfaction (Sisler & Titta, 2001).

While user-centered and empathic design are often viewed as being focused on the development of computer and paper interfaces, the field has a much wider application. The design philosophy has been applied to a diverse range of user interactions, from car dashboards to service processes such as the end-to-end experience of visiting a restaurant, including interactions such as being seated, choosing a meal, ordering food, paying the bill etc.

## **4.8 Mass customization**

### **4.8.1 Definition**

Mass customization refers to a customer co-design process of products or services that meet the needs of each individual customer with regard to certain product features. All operations are performed within a fixed solution space, characterized by stable but still flexible and responsive processes (Piller et al., 2005). Pine and Gilmore define mass customization as 'efficiently serving customers uniquely, combining the coequal imperatives for both low cost and individual customization present in today's highly turbulent, competitive environment' (Pine & Gilmore, 1999:72). It differs from differentiated offerings, e.g. offering large assortments, because people really get the chance to create their own offering. Too much choice usually leads to dissatisfaction with customers (Schwartz, 2005).

### **4.8.2 Evolution of mass customization**

Mass customization has emerged as a reaction on the increasing demand from society to deliver goods and services that meet personal needs or requirements from consumers (Åhlström & Westbrook, 1999; van Hoek et al., 1999). Mass production strategies that companies were following to reach efficiency in production processes encountered resistance from this society – consumers would no longer make their own needs subordinate to mass produced goods and services that are in fact design for the average of all individual needs (Tseng & Piller, 2003). Designing for the average is the root cause of customer sacrifice; every mass-produced product comprises a bundle of 'take-it-or-leave-it' features or dimensions offered to all customers. The more features bundled, the greater the likelihood of introducing some element that disqualifies the product with a particular buyer (either because he flat out doesn't want the element or doesn't want to incur the perceived higher price for a marginal element). Similarly, 'designing for the customer' in many organizations really means designing for 'the average customer' – who doesn't really exist (Pine & Gilmore, 1999). Customers, nowadays, want solutions tailored to their individual needs, not imperfectly fitting mass-market answers (Doyle, 1998). Managers must therefore abandon their mass-marketing/mass-production view and assume a mass-customizing/one-to-one marketing view. Information technology and flexible manufacturing systems enable mass customization, whereas interactive media and database technology enable one-to-one marketing (Peppers & Rogers, 1993). This

'twin logic' ties producer and customer together in a learning relationship: an ongoing connection that becomes smarter as the two interact with each other. In such a relationship, in time the customer 'teaches' the company more and more about his preferences and needs. The more the customer teaches the company, the better it becomes at supplying him exactly what he wants, paving new ways to innovations. Moreover, it will become more difficult for competitors to move in, because the switching costs for the customer (i.e. starting the teaching process all over again at the competing company) become higher as the relationship lasts longer. Or, in other words, these interactive learning processes will generate greater customer loyalty (Pine & Gilmore, 1999; van Asseldonk, 1998).

Mass customization leads to the commoditizing of products into services, because finished goods are no longer inventoried, but assembled and delivered on demand. And further customization leads to the development of *experiences* that use products as props and services as the stage for engaging the customer in such a way that it creates a memorable event. If an experience is designed so in tune with what an individual needs at an exact juncture in time, this individual has to be changed by guiding him to and through a life-transforming experience. These *transformations* are a 5<sup>th</sup> economic offering, whose value far exceeds that of any other (Gilmore & Pine, 1997).

#### **4.8.3 Modes of mass customization**

Pine and Gilmore (1999) distinguish collaborative, adaptive, cosmetic and transparent customization. Each is appropriate for reducing a different kind of sacrifice that, in turn, provides the basis for a particular type of experience. We will only elaborate a bit more on the first two modes of mass customization – collaborative and adaptive customization – because these introduce the customer in the world of innovating. In collaborative customization, the company conducts a dialogue with individual customers to help them articulate their needs, to identify the precise offering that fulfils those needs, and to make customized products for them. Collaborative customization is appropriate for businesses whose customers cannot easily articulate what they want and grow frustrated when forced to select from a plethora of options. Collaborative customizers work with individual customers to change first the *representation* of the product and then, once the customer figures out his true needs, the product itself. Customer and customizer thus mutually determine the value to be created. The customizer relinquishes some control of the process, allowing the buyer to participate directly in decision making and even some of the set-up work. Ideally, in addition to getting exactly what he wants, the customer uncovers aspects of his own wants and needs that he never knew existed. In the case of adaptive customization, neither the product itself nor the representation of the product is changed for the individual customer; rather the customer customizes the good or service as desired using customizable functionality embedded into the offering. Collaboration remains the right approach when each customer must choose from a vast number of elements or components to get the desired functionality or design. When alternative combinations can be built into the product, however, adaptive customization becomes a promising alternative for efficiently making many different options available to each customer. With adaptive customization, the customer independently derives his or her own value (Pine & Gilmore, 1999).

#### **4.8.4 Requirements for mass customization**

Mass customization differs from ad hoc customization in terms of costs. In order to obtain mass customization companies must modularize their goods and services, where a specific combination of modules is delivered for each particular customer. These possible combinations of modules are called the modular architecture. In addition to a modular architecture, mass customization requires an environmental architecture, that consists of two elements: a design tool that matches buyer needs with company capabilities – the so

called *configurator* (Franke & Piller, 2003; Salvador et al., 2002), and a designed interaction within which the company stages a design experience that helps the customer decide exactly what he or she wants, usually with the support of an online community (Franke & Piller, 2003; von Hippel & Katz, 2002). Without this environmental architecture, companies often overwhelm potential buyers with so many combinations of modules that they can't figure out which one makes sense, creating *mass confusion* (Piller et al., 2005). Companies can reveal, disclose or conceal all combinations depending on amount of combinations, complexity of the combinations and customer's capabilities to select the proper combination (Pine & Gilmore, 1999). In developing online mass customization tools it is important to offer easy to operate configuration tools or facilitate customer collaboration in communities in order to prevent the aforementioned mass confusion (Piller et al., 2005), enabling customers to easily create new combinations (Jeppesen, 2005). Applying these toolkits in a competitive setting for users gives firms the opportunity to access innovative ideas and solutions from users, shifting development and design from the locus of the firm to the user (Piller & Walcher, 2006; Thomke & von Hippel, 2002). Franke and Schreier (2002) differentiate the toolkits between high-end and low-end toolkits. Whereas the former has a wide scope of solution space, allowing users to create novel products actively and are aimed at innovative new products (which focus on innovation), the latter can be used to exploit seemingly mature markets (which focus on individualization) as they have a very narrow scope that enables the user to choose components passively from lists, as is with most mass customization offerings.

#### **4.8.5 Mass customization as co-design and its applications**

Mass customization is in a way a mode of *customer co-production*, as customers take part in the production of the good or service. But, as the main part of the interaction with the customer takes place during the configuration, and therefore the design of a customer specific product, it would be better to call the customer a *co-designer* rather than a *co-producer* (Franke & Piller, 2003; Tseng & Piller, 2003). This mode of operations can be called as customer co-design, where customers are recruited as designers of the company. Customer co-design then describes a process that allows customers to express their product requirements and carry out product realization processes by mapping the requirements into the physical domain of the product (Khalid & Helander, 2003; von Hippel, 1998). During these co-designing processes, customers sometimes even take over the role of being innovators: the need-information is converted into a solution at the locus of the customer without costly shifts of the info from customer to manufacturer (Franke & Piller, 2003). Customer co-design places some new requirements for organization's information systems. First of all, the system would require tools for designing, voting and collaboration built in the web platform as well as support for building on-line communities via social transparency (Mäkipää et al., 2006). In *customer integration* the customer "takes part in activities and processes which used to be seen as the domain of the company (Wikström, 1996). The customer can choose from an infinite set of options an individualized combination or even extend the options and even invent new ones. During this process of elicitation, the customer is being integrated into the value creation of the supplier (Piller et al., 2005).

We find mass customization appliances with design possibilities in all kinds of industries, both consumer and industrial (Berger et al., 2005), and both online as offline (Pine & Gilmore, 1999). LEGO Factory and miAdidas are well known examples (Piller et al., 2005).



## 4.9 User innovation

We refer to user innovation as innovations developed by customers and end users for their own benefit, rather than manufacturers. Tracing the sources of innovation, it was found that users actually are the ones that typically develop the functionally new products that later become major commercial successes (von Hippel, 2005). For instance, in Shah's study (2007) of sports related innovation communities, users developed the first-of-type innovation in each of the three industries studied, that is, users developed the first skateboard, the first snowboard, and the first windsurfer.

### 4.9.1 *Many users innovate*

The driving force behind the theory on user innovation comes from von Hippel (1976; 1977; 1986; 1988). His seminal studies have proven that organizations were not the only ones having the abilities to make valuable innovations and that the users also have innovative abilities. His findings show that the source of innovation varies across industries – users and manufacturers are the main contributors in innovation, even though they are motivated for totally different reasons (von Hippel, 1988). Manufacturers innovate in order to sell the innovation, to profit from it. Users innovate or develop an innovation because the existing products do not match their needs or requirements. In several, following studies it was found that users rather than equipment producers are the actual developers of most functionally and commercially important process equipment innovations. The first heart-lung machine, for example, and the first skateboard as well, both were first prototyped and applied by users (von Hippel, 2005). Enos (1962) reported that nearly all the most important innovations in oil refining processes were developed by user firms. Freeman (1968) found that the most widely licensed chemical production processes were developed by user firms. Pavitt (1984) found that a considerable fraction of inventions by British firms was for in-house use. VanderWerf (VanderWerf, 1992) studied samples of important industrial gas-using and plastics forming process equipment innovations, and found in both samples, that users were to be the most frequent developers of these innovations. The majority of important innovations in some extreme sports, like snowboarding, windsurfing and skateboarding equipment, were originally developed by users (Shah, 2000). Lüthje (2004) shows for instance that a large fraction of consumers do innovate in some way. Several researchers found lead user percentages varying from 20 to 40 % (Franke & Shah, 2003; Franke et al., 2006; Lüthje, 2004; Lüthje et al., 2005; Morrison et al., 2000; von Hippel, 1988). Interestingly, this user-innovator phenomenon is not limited to products, but can also be observed for services. In a study von Hippel and Oliveira (2009) explore the histories of 47 functionally novel and important commercial and retail banking services and find that, in 85% of these cases, users self-provided the service before any bank offered it. The authors observe that their findings are generalizable for many situations where users are able to self-service, i.e. execute the service themselves.

Table 4-1 summarizes several studies that have been conducted in the field of user innovators by providing the percentages of user innovators. In our opinion, these high percentages of user innovators could even be higher in reality, because many would be innovators are likely to be inhibited to modify or innovate because of IP protection legislation in many industrial countries. This can be illustrated by the higher percentages that European researches, e.g. (de Jong & von Hippel, 2009) in user innovations reveal than in the United States, where law suits are more common than in Europe.

Innovation Area	Number and/or type of users sampled	% user innovators found in the study	Source
Semiconductor production equipment	Machine users	67%	Von Hippel 1977
Pultrusion processing equipment	Users	90%	Lionetta 1977
Medical instruments	33 user innovations	25 were transferred from user to firm, 22 were successful	Shaw 1983
PC CAD Software	136 user firm attendees at a conference	24.3 %	Urban and von Hippel 1988
Sports-related equipment, consumer users: snowboarding, skateboarding and windsurfing	End users were always the developers of the first version of the basic equipment in these fields	58% of the major improvements were developed by lead user and user-manufacturers	(Shah, 2000)
Library Information System Software	Employees in 102 Australian libraries using computerized OPAC library information systems	26%	Morrison et al. 2000
Medical Surgery Equipment (Germany)	261 surgeons working in university clinics in Germany	22%	Lüthje 2003
Voluntary community of end-users that develop novel sports related goods		32% says to have innovated; 14.5% are totally new created products	Franke and Shah 2003
Apache OS server software security features	131 technically sophisticated Apache users (webmasters)	19.1%	Franke and von Hippel 2003 (Franke & von Hippel, 2003)
26 Advanced Manufacturing Technologies introduced into Canadian plants	Canadian manufacturing plants in 9 Manufacturing Sectors (less food processing) in Canada, 1998 (population estimates based upon a sample of 4,200)	28% developed 26% modified	Arundel and Sonntag 1999 (Arundel & Sonntag, 1999)
Any type of process innovation or process modification	Representative, cross-industry sample of 498 high-tech Dutch SMEs	41% developed only 34% modified only 54% developed and/or modified	De Jong and von Hippel 2009 (de Jong & von Hippel, 2009)
Pipe hangers hardware in Switzerland	54	36%	Herstatt & von Hippel, 1992
Kite surfing equipment in Australia	157	26%	Tietz et al., 2005
Extreme sporting equipment	197	38%	Franke & Shah, 2002
Equipment for outdoor sports (Germany)	153	10%	Lüthje, 2004
Mountain Biking Equipment	291	19.2%	Lüthje, Herstatt & von Hippel, 2002 (Luthje et al., 2002)

**Table 4-1: Studies of frequencies of innovations by users**

#### **4.9.2 Lead users**

Von Hippel identified a specific segment of users that act as user innovators, which he called lead users (von Hippel, 1986). He defines lead users as

“... users who present strong needs that will become general in a marketplace months or years in the future. Since lead users are familiar with conditions which lie in the future for most others, they can serve as a need-forecasting laboratory for marketing research. Moreover, since lead users often attempt to fill the need they experience, they can provide new product concept and design data as well” (1986:791).

In a more recent publication lead users are defined as

“members of a user population who (1) anticipate obtaining relatively high benefits from obtaining a solution to their needs and so may innovate and (2) are at the leading edge of important trends in a marketplace under study and so are currently experiencing needs that will later be experienced by many users in that marketplace” (Franke et al., 2006:302).

Since lead users are at the leading edge of the market with respect to important market trends, one can guess that many of the novel products they develop for their own use will appeal to other users too and so might provide the basis for products manufacturers would wish to commercialize. In a way, lead users serve as a beacon for where the mainstream market is headed (Tapscott & Williams, 2007). This turns out to be the case (von Hippel, 2005). A number of studies have shown that many of the innovations reported by lead users are judged to be commercially attractive and/or have actually been commercialized by manufacturers (Hienerth, 2006; Urban & von Hippel, 1988).

Von Hippel's studies have inspired many others to study the phenomenon of 'lead users', not only in the USA (Lilien et al., 2002; Morrison et al., 2004; Seybold, 2006) but also in Europe, like in Denmark with Jeppesen (2000;2002;2004;2005), Norway with Olson and Bakke (2001), Germany with Lettl (Lettl & Gemünden, 2005; Lettl & Herstatt, 2004; Lettl et al., 2006a;2006b; Lettl et al., 2009), and Austria with Franke, Schreier and Prügl (Franke & Schreier, 2002;2006; Franke & Shah, 2003; Franke & von Hippel, 2003; Franke et al., 2006; Prügl & Schreier, 2006; Schreier & Prügl, 2008). In the Netherlands the phenomenon has reached attention only recently through engagement of von Hippel by the EIM (de Jong & von Hippel, 2009). It can be noted at this instance that all these research and studies are focused on lead users, implying that lead users might be the one and only customers' source for innovation that firms have.

#### **4.9.3 Motivations for users to innovate**

Lead users do not innovate to compete with the manufacturer, but rather because of sticky *information* – information that is hard to communicate and transfer to the firm. This means that where information 'sticks' with users, that innovation will be most probably initiated by users, and the other way around. In this sense, 'stickiness of innovation-related information' could be an indicator in predicting the locus of innovation in several sectors (von Hippel, 1994). Unless an organization succeeds in motivating these lead users to submit their ideas, designs and concepts to the firm, lead users are likely to innovate themselves. So organizations have to develop systems based on the newest communication technology that motivate the users to share their sticky knowledge, and further facilitate that the sticky and tacit knowledge can be made explicit. In a related perspective, the user innovation approach (von Hippel, 1976; von Hippel, 1977; von Hippel, 1988) focuses on end users as a source of innovation. Basically, user innovators generate new applications, products and problem solutions (in different development stages) themselves, often based on existing products from manufacturers, developing new uses and techniques or completely new products and solutions. User innovators have a direct personal need but usually no commercial interest. Thus, no manufacturer is involved in their innovative activities; users themselves test and retest their innovations (Thomke & von Hippel, 2002; von Hippel, 1988). For an example from a police user innovator, see Box 4-1. The impact of sticky local information hinders the transfer of problem-solving capabilities from one individual, the user, to another, the manufacturer (Mascitelli, 2000; von Hippel, 1998). For users, it is easier to cooperate and interact with other users in the community, where they share information for free (Lüthje et al., 2005). Innovations from users do not have to pass traditional screening stages and follow company rules or standardized routines (Meeus & Oerlemans, 2000).



#### Box 4-1: User innovation in the Dutch Police Force (source: de Telegraaf, September 24, 2009).

Some time after user innovation begins, the first user-purchasers appear – these are users who want to buy the goods that embody the lead user innovations rather than building them for themselves. Manufacturers emerge in response to this demand. Baldwin et al. (2006) show that, under quite general conditions, the first manufacturers to enter the market are likely to be user-innovators who use the same flexible, high-variable-cost, low-capital production technologies they use to build their own prototypes. The relatively high variable costs of these user-manufacturers will tend to limit the size of the market. As information about product designs becomes codified, and as market volumes grow manufacturers—both existing user-manufacturers and established manufacturers from other fields—can justify investing in higher-volume production processes involving higher capital investments. These processes have lower variable costs, hence their use will tend to drive prices lower and expand the market. User-purchasers then have a choice between lower-cost standardized goods and higher-cost, more advanced models that user-innovators continue to develop (Baldwin et al., 2006).

#### 4.9.4 Applications of user innovation

User innovation has several appearances: innovation of use, innovation in services, innovation in configuration of existing technologies, and finally the innovation of novel technologies themselves. While most user innovation is concentrated in use and configuration of existing products and technologies, and is a normal part of long term innovation, new technologies that are easier for end users to change and innovate with and new channel of communication are making it much easier for user innovation to occur and have an impact. Examples of lead user innovations in the sports sector are the mountain bike (Lüthje et al., 2005), kayak rodeo (Hienerth, 2006) and kite surfing (Tietz et al., 2005); in the industrial sector some well known examples are 3M (von Hippel et al., 1999), Staples (Seybold, 2006) and the building industry (Intrachooto, 2004). 3M Corporation is one firm that has learned to identify lead user innovation systematically. Research has found that new 3M products based upon the insights and solutions of lead

users have sales 8 times higher than those developed based upon insights derived from target market users (von Hippel et al., 1999).

We conclude by stating that user innovation in itself isn't a mode of customer involvement in firms' innovations, unless companies succeed in harnessing their customers' creative potential into the development and commercialization of a new product or service.

## **4.10 Open Source Software**

### ***4.10.1 Distinction from co-design***

In general, co-design and co-development imply collaboration between a firm and its customers or users *within* the firm's boundaries. Open source stretches the design function and goes beyond the firm's boundaries. Open source software (OSS) is software of which the source code is available to the public and therefore can be used, changed, and redistributed according to specific licensing rules to make sure no one can appropriate the code. In comparison, proprietary firms aggressively protect their software source code (West & Gallagher, 2006b). Sharing the source code is useful insofar as it makes possible ongoing improvements by many programmers. Users may alter the program for their specific purposes. Sponsors of open source projects usually copyright the software in such a way that other developers cannot copyright programs using the open source code. This is a powerful mechanism to support *collective invention* because it is common knowledge that some later improvements will become part of the shared code (Meyer, 2003). An allied but distinct group, the 'free software' movement, also requires that software remain perpetually 'free' by compelling users to return all modifications, enhancements, and extensions (West & Gallagher, 2006b).

Another important difference between open source and proprietary efforts is the collaborative open source production process (West & Gallagher, 2006b). The code is developed by groups of thousands of voluntary developers who collaborate in online communities. Although many people did not believe in the concept at the start (why would people do this work voluntarily, working with people they have never met before?), there were many people who were willing to do the job, and they did it successfully. Several open source products have demonstrated that these projects can indeed lead to software systems with high functionality and quality.

The success of OSS products such as Linux is widely acknowledged (Amant & Still, 2007). A study published in the European Journal of Information Systems in 2000, noted that 'open-source software attains quality that outperforms commercial proprietary' approaches (Ljungberg, 2000). A number of co-created products have crossed a quality threshold to become widely adopted. A survey by Netcraft, an internet research firm, showed that the co-created open-source Web-server program Apache runs more than half of all Web sites and that eight of the ten most reliable Internet hosting companies run Linux (Bughin et al., 2008).

### ***4.10.2 Motivation to participate in open source***

An open source software community is a comfortable and exciting working environment, since the volunteers can choose their own tasks to work on, which usually are the ones they are best in, and can decide how much time to spend working on it. Participants are motivated by their own personal software needs, learning opportunities and social interaction (Bloem & van Doorn, 2007; Hertel et al., 2003), as well the expectation to receive a reciprocation at some time in the future (von Hippel & von Krogh, 2003). Research has shown that with the proper mechanisms in place, a group of intrinsically

motivated, self-organizing volunteers can be at least as productive as a firm (Wendel de Joode, 2005).

In 2003, Lakhani and von Hippel (2003) explored the Apache open-source software case from 2000 and showed how user to user assistance in the open source software works and is developed. Lakhani and von Hippel find the following user motives for engaging in open source software development:

- A user's direct need for software and software improvements
- Enjoyment of the work itself
- The enhanced reputation that may flow from making high-quality contributions to an open source project.

Although we see open source mainly applied in software development, we see other areas where open source principles are applied to involve amateur participants in product development (Tapscott & Williams, 2007), including marketing (Ancarani & Shankar, 2003; Pitt et al., 2006), healthcare, publishing, science (Goetz, 2003) and even space technology (Hancock, 2005b). In the case of open source development for tangible goods we speak of *open design* (Balka et al., 2009). Such open source offerings typically describe products, services, and ideas for which the intellectual input of the inventors and producers is non-proprietary in nature.

## **4.11 User generated content**

### ***4.11.1 Definition and emergence***

User-generated content (UGC), also known as Consumer Generated Media or User-created Content (UCC) (Wunsch-Vincent & Vickery, 2007), refers to various kinds of media content that are produced by end-users, as opposed to traditional media producers such as professional writers, publishers, journalists, licensed broadcasters and production companies, whether it's a comment left on Amazon.com, a professional-quality video uploaded to YouTube, or a student's profile on Facebook. The term entered mainstream usage during 2005 after arising in web publishing and new media content production circles. It reflects the expansion of media production through new technologies that are accessible and affordable to the general public. These include forums, weblogs, podcasts, wikis and the posting of digital video and photographs. In 2006, UGC sites attracted 69 million users in the United States alone, and in 2007 generated \$1 billion in advertising revenue. By 2011, UGC sites are projected to attract 101 million users in the U.S. and earn \$4.3 billion in ad revenue (IAB, 2008).

### ***4.11.2 History: Early forms of UGC***

UGC has been a staple of the peer-to-peer experience since the dawn of the digital age. The earliest forms arrived in 1980 with Usenet, a global discussion network that allowed users to share comments and experiences of a given topic. Early versions of Prodigy, a computer network launched in 1988, also facilitated user discussions and comments, as did early versions of AOL. The late 1990s saw the rise of "ratings sites," which allowed users to rate subjects based on any number of criteria, from physical appearance (ratemyface.com and hotornot.com) to professional competence (ratemyprofessors.com). These spread quickly across the Internet, and brought with them controversy over the impact they could have on the lives of private people often unwittingly exposed to public scrutiny. Such controversies have increased as UGC sites have become more common and influential.

Another early form of UGC are forums; areas within content websites that allow readers to communicate with each other around topics related to the content. Even in this era dominated by social media sites, forums continue to be robust, controlled areas of user content. For example, CondeNet sites incorporated forums as early as 1995, and they are still excellent areas for marketers to research opinions and general trends.

### **4.11.3 Varying user involvement**

Sometimes UGC can constitute only a portion of a website. For example on Amazon.com the majority of content is prepared by administrators, but numerous user reviews of the products being sold are submitted by regular visitors to the site, where consumers share their brand experiences in order to help others make more informed purchasing decisions. Most of these sites are grouped by category, such as electronics, automotive and tourism, to name a few. They are generally well moderated and can be very brand friendly to the company that respects their culture and is willing to participate. In October 2007, a Nielsen study found that consumer recommendations are the most trusted form of advertising around the world. Over three-quarters of respondents from 47 markets across the world rated recommendations from consumers as a trusted form of advertising. Compare that to 63% for newspapers, 56% for TV and magazines, and 34% for search engine ads (IAB, 2008). Review sites are frequently where consumers go to find those recommendations, making them an important place for marketers to have a voice.

But in many cases the complete website thrives on user input via *blogs*<sup>17</sup> and *wikis*<sup>18</sup>, as is the case with Wikipedia and YouTube. The contributions of countless people can be aggregated into vast compilations that surpass traditional offerings. Such scale doesn't require broad or deep contribution: Only a small percentage of users may contribute (about one user in 1,000 for Wikipedia) and active contributions may require little effort (as with Flickr, the photo-sharing site). Some contribution systems give companies a structural advantage over rivals because of network effects. That is, the more people who contribute to the system, the more useful it becomes, creating an upward spiral in which increasingly more people choose to use and contribute to it (Cook, 2008). Often UGC is partially or totally monitored by website administrators to avoid offensive content or language, copyright infringement issues, or simply to determine if the content posted is relevant to the site's general theme.

The promise of UGC is now being hyper-realized with social media. Sites like MySpace, Facebook, and YouTube represent the convergence of user commentary with video, photos, and music sharing, all presented in a simple, user-friendly format, allowing participation on a mass scale. According to an April 2007, iProspect/Jupiter Research

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<sup>17</sup> Blog is short for Weblog, a term that denotes a personal diary or journal maintained on the Web. In its purest form, a blog is just that, a personal journal maintained by an individual, updated frequently, and viewable by anyone on the Internet. The entries generally appear in reverse chronological order, meaning the most recent is at the top of the page and others can be found by scrolling down, with archived entries available through links at the bottom or sides of the page. Blogs have always spanned a wide range of content. Some consist of little more than weekly updates about one's pets, while others become hotbeds of political discussion, even influencing debate on a national scale (IAB, 2008).

<sup>18</sup> In its most basic sense, a Wiki is collaboration, a Web site built through the contributions of many individuals. Though not all wikis are open to everyone—indeed, many require some kind of membership or qualification to contribute—they are in many ways the most democratic manifestation of UGC. These individuals may never meet, or live in the same country, or even communicate, but the principle behind wikis is simple: All the world's expertise, knowledge, and creativity can be harnessed through Internet collaboration (Guerin, 2004).

study, the most frequently visited social networking sites are visited by approximately one out of every four Internet users at least once a month (IAB, 2008).

#### ***4.11.4 Motivation for users to contribute***

Most user-created content activity is undertaken without the expectation of remuneration or profit. Motivating factors include connecting with peers, achieving a certain level of fame, notoriety or prestige, and self-expression. Technical and content quality is guaranteed through the choice of the traditional media "gatekeepers". Relative to the potential supply, only a few works are eventually distributed, for example, via television or other media (Wunsch-Vincent & Vickery, 2007). In the UGC value chain, content is directly created and posted for or on UGC platforms using devices (e.g. digital cameras), software (video editing tools), UGC platforms and an Internet access provider. There are many active creators and a large supply of content that can engage viewers, creating a potential competition for traditional media. Users are also inspired by, and build on, existing works as in the traditional media chain. Users select what does and does not work, for example, through recommending and rating, giving guide to visitors and leading to recognition of creators who would not be selected by traditional media publishers. Users are better than executives at picking winners in this arena (Cook, 2008).

#### ***4.11.5 Objections towards UGC***

User-generated content has also come under fire from established media outlets such as the New York Times. Many claim that the quality of user-generated content is not up to par with the quality produced by formally trained writers and is contributing to the decline of standards in publishing, particularly with regard to news (Wunsch-Vincent & Vickery, 2007) or even 'truth' (Keen, 2007). In contrast, a December 2005 study published in the scientific journal *Nature* concluded that Wikipedia's entries on scientific subjects were generally as accurate as those in the *Encyclopedia Britannica* (Giles, 2005). Another concern often raised is relating to privacy, with social networking sites encouraging users to share their personal information and messages in publicly viewable areas.

However, user-created content is already an important economic phenomenon despite its originally non-commercial context, e.g. iStockphoto.com which started as a creative outlet for amateur photographers and has become a real competition for professional photography. The spread of UGC and the amount of attention devoted to it by users appears to be a significant disruptive force for how content is created and consumed and for traditional content suppliers.

## **4.12 Crowdsourcing**

### ***4.12.1 Defining crowdsourcing***

Crowdsourcing is closely related to customer co-creation in innovations since it also involves non-professionals performing some tasks for firms. These non-professionals are referred to as a crowd, since crowdsourcing stands for outsourcing to the crowd (Howe, 2006), implying a massive and numerous amount of participants. Since there are several ways to use the crowd, crowdsourcing can be seen as a collection of business models (Geerts, 2009). This means that although crowdsourcing is closely related to OSS and UGC, crowdsourcing is meant to result in a profit. The – for many unexpected – high quality products that resulted from OSS and UGC initiatives inspired other sectors to apply the principle of involving non-professionals in their activities and finding ways to make a profit from the crowd's efforts.



#### ***4.12.2 Modes of crowdsourcing***

One of the ways to involve a crowd in a firm's innovation activities is the use of online user communities (Chan & Lee, 2004; Janzik & Herstatt, 2008; Nambisan, 2002). Generally these initiatives involve a forum where participants can post their ideas and suggestions for new products or services, comment on each other's postings and vote for the best contributions. Participants generally do not get paid for their input, but are motivated by personal needs and the social benefits that such a community can provide. Many companies have found the ideas and the discussions a very useful input for their innovation process (Howe, 2008). Furthermore, firms benefit from the loyal customer base that results from the open way of interaction between customers and the firm (Li & Bernoff, 2008). That it is not always the customers that are involved is demonstrated by another type of crowdsourcing. In this business model, a specific challenge is broadcasted to the widest possible audience in the hope that someone will be able to solve it (Howe, 2008).

Geerts (2009) distinguishes four types of crowdsourcing, based on two aspects, namely whose contributions are used and the party that takes initiative. These are (1) crowdcasting which involves competitions, casted by the company, where individuals can upload their submissions and compete for a financial reward; (2) crowdstorming where forums are the main method for participation, allowing participants to take much more initiative, because they can start discussions and propose new topics – not being dependent on the organization – which can be used by the crowdsourcing company; (3) crowd production representing initiatives in which the crowd produces something together, for example a database that is used for research, or content for a website; (4) crowdfunding representing markets between borrowers and lenders, or possibilities for the crowd to fund a project or company.

It is suggested that where crowdsourcing encourages participation and harnesses peer-production within a large dedicated community, it simply doesn't work if the crowd is too small (Powell, 2009). Without a vast community to use in soliciting responses, sustainable talent is a rarity. This implies that small businesses with a relatively small customer base cannot employ crowdsourcing on a continuous basis. They either have to use it as a one-off or not at all. However, this suggestion has not been researched yet, leaving the matter unsolved.

#### ***4.12.3 Motivation to participate in crowdsourcing***

The crowd at InnoCentive, where complex scientific challenges are posted and solved, consists of about 160,000 people who are intrinsically motivated by these challenges and compete for a prize. In exchange for the monetary reward, the firm receives the rights of the solution and can use it to make a profit. Despite the fact that these solvers can be considered hobbyists, they are able to solve some of the challenges that have puzzled the R&D departments of some prominent firms for months (Tapscott & Williams, 2007). The basis for the success of this business model lies in the fact that the more diverse the crowd, the higher the chance that someone will have a solution. Crowdsourcing actually presumes that a large number of enthusiasts can outperform a small group of experienced professionals (Antikainen et al., 2006).

#### ***4.12.4 Applications***

Crowdsourcing is becoming more and more popular and is used by many firms and organizations. A typical deployment of crowdsourcing is that for global sustainability problems (Bloem et al., 2009), e.g. the Boeing Dreamliner, which engaged with a 'World Design Team' of 120,000 people, the C,mm,n (common) car by Rabobank, Athlon Car Lease, Philips and Akzo, and Patientslikeme.com with a study on the effect of lithium on

the muscular disease ACS. Many intermediaries jump into this opportunity, e.g. InnoCentive assembling ideas to clean up spilled oil for Exxon Valley, and Battle of Concepts for Heerema and Eneco. Harvard Business School did a study on the success of and found that of 166 problems a third were solved by 80.000 participants. Boeing did it with its ground-breaking passenger jet, the Dreamliner, and took on board the views of thousands of experts, even its suppliers. This wasn't simply about choosing the seat color, either. Many contributions related to complex technological issues and the results seemed to have paid dividends. The Dreamliner recently made its maiden flight, but isn't due to enter service for another year. However, it's already the fastest-selling wide-bodied airliner ever.

## 4.13 Customer co-creation

### 4.13.1 Definition

Finally we will address the phenomenon of *co-creation*. The term co-creation refers to creativity where more than one person is involved, resulting in a product that something none of the creators could or would have achieved working alone (Sanders & Stappers, 2008). Co-creation does not necessarily imply the involvement of *customers* – the creation of a new product by two different firms is also co-creation. We will therefore avoid the use of the term co-creation, and will designate it more specifically by *customer co-creation*. Customer co-creation is the collaboration between firms and customers to create value together, rather than by the firm alone (Boswijk et al., 2005; Prahalad & Krishnan, 2008; Prahalad & Ramaswamy, 2003). It is neither the transfer nor outsourcing of activities to customers, nor a marginal customization of products and services. Co-creation is a leap forward from personalization and customization (Friesen, 2001) – see section 4.7. Co-creation is not a scripting or staging of customer events around the firm's various offerings, either, like Pine and Gilmore (1999) and McAlexander et al. (2002) propose. It involves the co-creation of value through personalized interactions that are meaningful and sensitive to a specific customer. The co-creation experience (not the offering) is the basis of unique value for each individual (Boswijk et al., 2005). The market thus begins to resemble a forum organized around individuals and their co-creation experiences rather than around passive pockets of demand for the firm's offerings (Prahalad & Ramaswamy, 2003).

### 4.13.2 Application

Co-creation challenges the existing power structures of companies that are built on hierarchy and control – it requires that control be relinquished and given to (potential) customers (Sanders & Stappers, 2008). Co-creation is becoming more evident in marketing, where companies such as LEGO have successfully engaged many of their adult customers in designing new products (Antorini & Schultz, 2007), or Converse, which persuaded large numbers of its most passionate customers to create their own video advertisements for the product. Many other examples of co-creation are now under way. One of them, participatory marketing, which encourages customers to help create marketing campaigns, is sometimes more than just a new tactic to attract attention (Bughin et al., 2008).

We see co-creation happening for different aspects of value creation (source Trendwatching.com):

#### Advertising

Virtually every brand these days seems to be inviting their customers to contribute to their next advertising campaign. Recent examples like L'Oreal's You Make The

Commercial, FireFox's Flicks, MasterCard's Write a Priceless Ad, JetBlue's Travel Stories and McDonalds' Global Casting are only a few we can mention.

## **Product and service development**

The easiest way for brands to dip their toes into customer co-creation and tap the global crowd is to announce product or service development contests – open to customers from around the world – through crowdsourcing. For example, the Nokia Concept Lounge that took place in the summer of 2005 invited professional and amateur designers in the Benelux to share ideas and design the next new cool phone. Entries came from all over, with the winner being a Turkish designer, Tamer Nakisci, with a wrist-band style phone (the 'Nokia 888'). What goes for phones also goes for coffee. Nespresso's 2005 Design Contest aimed at imagining the future of coffee rituals, yielded gems like the Nespresso InCar coffee machine and the Nespresso Chipcard (which stores coffee preferences for registered individuals, and when inserted into a vending machine, communicates with a central database to brew a personalized cup of coffee). End of 2006 the Dutch supermarket chain Albert Heijn did something similar: instead of installing suggestion boxes that customers don't use and stores don't empty, they asked customers for detailed feedback on how to improve their stores, through websites, leaflets and billboards. More than 55,000 customers participated, commenting on service, assortment and convenience levels in over 700 stores in The Netherlands. 700 submitters of 'Golden Tips' (which are online for all to see) won one-minute shopping sprees, with individual stores committing to implement suggestions as soon as possible. The Electrolux Design Lab 2005 attracted entries from over 3,058 design students from 88 countries around the world, the top six countries being the US, the UK, China, India, Brazil and Italy. Participants were asked to design household appliances for the year 2020. Twelve finalists participated in a six-day design event in Stockholm, including workshops, model building and a competition for cash-awards, appliances and more. The competition's registration process was run via Designboom, an industrial design community. More to come: the theme for the new Electrolux DesignLab 2006 is "Healthy Eating Habits in 2016", asking for product ideas for food preservation and preparation. TV isn't exempt, either: The L-Word Fanisode competition called for co-creating an episode of the hit television show, assembling a full script, scene by scene. The contest ran from January - March 2006, with the show's real (paid) writers outlining a scene and giving guidance, giving fans about a week per scene to submit offerings, peruse others people's submissions, and vote. The grand prize winner got a script-writing session with L Word creator Ilene Chaiken and USD 2,000 credit at Saks Fifth Avenue. (Source: BusinessWeek). Stylish Japanese purveyor of all things minimalist Muji is also launching an international design competition, which started in 2007. Calling on the entire world, Muji's first theme is "SUMI", (corner / edge / end). From the site's briefing: "The objective is not to design something that is placed in the middle of the room, but towards the edges, not at the centre and not directly around the centre; you should look for somewhere that evades the eye, send us an object designed for that place, and name it as you wish. We are not asking for any particular genre, it could be anything from furniture, stationery and office equipment, to everyday items." Just like aforementioned Nespresso, winners will be announced at the Milan Salone.

## **4.14 The construct: customer co-creation in innovations**

### ***4.14.1 Defining customer co-creation in innovations***

The overview we have given in the previous sections is not exhaustive – there are many more modes or terms for customer involvement in business processes or value creation, e.g. customer engagement (Ahonen & Moore, 2005; Eilander, 2009), open design (Hancock, 2005a), and co-production (Davenport et al., 2006). Not all of them are focused on innovation, nor are they all distinctive approaches or modes for involvement –

there exists a certain overlap in appliance and objectives. Customer involvement can be viewed as the acquisition of certain resources that the firm does not have available, thereby fitting the *resource-based view* (Hamel & Prahalad, 1994) or the transaction between firms and their customers, fitting the *transaction costs economics* (Williamson, 1981). We would like to emphasize, however, that customer involvement in this sense refers to participation of customers in the value creation activities of a firm, and not as consumer involvement in a product or product category, as is commonly referred to (Laurent & Kapferer, 1985).

We have reviewed those modes of involving customers (or users) in a firm's business process that have the intention to innovate or may lead to innovations. Such customer involvement goes by different names in literature. The literature states a number of strongly allied concepts of customer involvement in product or service development and delivering, e.g. lead user method (von Hippel, 1986), *co-development* (Anderson & Crocca, 1993; Mullern et al., 1993; Neale & Corkindale, 1998), co-opting customer competence (Prahalad & Ramaswamy, 2000), *customer participation* (Barki & Hartwick, 1989; Martin & Horne, 1995), *user involvement* (Alam, 2002; Kaulio, 1998), consumer involvement (Pitta & Franzak, 1996), *partnership* (Campbell & Cooper, 1999), *co-creation* (Prahalad & Ramaswamy, 2003), *value co-production* (Normann, 2001; Normann & Ramirez, 1993; Ramírez, 1999), *customer integration* (Koufteros et al., 2005; Reichwald et al., 2005), *community sourcing* (Prügl & Schreier, 2006), customer interaction (Gruner & Homburg, 2000), and *customer involvement* (Alam, 2006a). Surprisingly, explicit definitions of these concepts are often absent. A number of different parameters are used to describe these concepts, e.g. degree or intensity of customer involvement (Alam, 2002; Gruner & Homburg, 2000; Kaulio, 1998; Martin & Horne, 1995; Shaw, 1985; Voss, 1985), customer characteristics (Gruner & Homburg, 2000; von Hippel, 1986), objectives of customer involvement (Alam, 2002; Anderson & Crocca, 1993), phases of the innovation process (Alam, 2002; Mullern et al., 1993; von Hippel, 1986), customer role in the process (Mullern et al., 1993; Wikström, 1996), modes of customer involvement (Alam, 2002; Ciccantelli & Magidson, 1993; Gustafsson et al., 1999; Leonard & Rayport, 1997; Pitta & Franzak, 1996; Thomke, 2003; Ulwick, 2002; von Hippel, 1986; 2001b), contributions (Neale & Corkindale, 1998; Prahalad & Ramaswamy, 2000), and inhibiting factors of customer involvement (Martin et al., 1999; Olson & Bakke, 2001). Yet, in spite of the diversity in variables to describe the phenomenon, literature remains unclear in providing clear guidelines. These ambiguities regarding subjects to involve, moments of involvement, conditions for involvement and even the activeness of the subject to be involved are to be clarified in our protocol to be designed.

Barki and Hartwick (1994) claim that the concepts of user participation and user involvement are clearly different constructs. They recommend to use the term user participation instead of user involvement when referring to the assignments, activities, and behaviors that users or their representatives perform during the systems development process and to use the term user involvement to refer to a subjective psychological state reflecting the importance and personal relevance that a user attaches to a given system. Users may be said to participate in ISD when they take part in, or contribute to, the system being developed. Participation can therefore be measured by assessing the specific assignments, activities, and behaviors that users or their representatives perform during the systems development process<sup>19</sup>. According to Cavaye (1995) this is partially correct: describing user participation in terms of activities engaged

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<sup>19</sup> At this point we can observe that two types of users can be distinguished: the active ones as depicted in the definition of user participation; and the passive ones in the definition of user involvement.

in by users does not provide a complete and accurate picture, because there are many different ways in which users can play a part in system development.

We will therefore use the term *customer co-creation* where the term customer refers to the (potential) end users of product and services – the choice for this restriction to end users will be clarified when developing our design propositions. Based on the review of studies in the previous chapter, we can also define *customer co-creation in innovations* as the process where product manufacturers and/or service providers engage with their end users in (parts or phases of) innovation projects to jointly perform innovation activities and co-create value, with the aim of increasing effectiveness and efficiency of the innovation process. Effectiveness refers to (1) the result of meeting users' needs and demands in a better way; and (2) increasing customer loyalty. Efficiency refers to (1) the reduction of research and development costs; and (2) the reduction of development time.

#### **4.14.2 Customer Co-Creation in Innovations (3CI) framework**

Customer co-creation in innovations, as we have seen in the preceding review, is not an intervention that can take place at any opportunity, time or situation. Companies that want to involve their customers may have to take into account some contingencies, factors and aspects which determine whether and how to apply this interventions. Sandén (2006) distinguishes four dimensions to frame and describe the construct of customer involvement: (1) situational factors, such as market, project, cultural and organizational factor; (2) strategic decisions determining the strategic objectives, customer characteristics, when to use customer involvement and the degree of involvement; (3) operational decisions on the selection and recruitment of customers and the supporting techniques; and (4) performance aspects. In her analysis of over 100 crowdsourcing and co-creation cases Geerts (2009) distinguishes – based on the CIMO-logic – three main categories of attributes that are suited to describe the cases: (1) Context attributes, consisting of the innovation stage and the sector/field the company operates in; (2) Intervention attributes (design choices organizations have), consisting of the role of the company (mediated or own initiative), type of participation, party that takes the initiative, whose contributions are used, the administration of (financial) rewards, with or without interaction, control of the input, control of the output, IP protection or not; and (3) Outcome attributes, such as size and activity of the crowd, composition of the participants, number and quality of the contributions, and company effort. Since we are looking a prescriptive view on the construct and the elaboration already provided on the expected performance of customer co-creation, we modify this approach and distil the following framework of categories of determining factors and aspects – which we will call the Customer co-creation in innovations (3CI) framework:

##### **1. Context of involvement, entailing:**

- The *nature of the firm, its markets and economic and technological environment* that determine whether and to what extent a firm can involve its customers in innovations. Here we can make a distinction between product and service providers, the market type (B2B, B2C) and maturity, the type of industry and eventually not for profit situations.
- The *source of the innovation*, distinguishing between customer initiated ideas and company initiated ideas, indicating whether the company should look for individual contributions from single customers or collective contributions from communities.
- The *type of innovation* where customer involvement is required or appreciated. Here we can make distinction between product, service and process innovations (object of innovation), radical and incremental innovations (novelty), and the openness (disclosure to external parties).

2. Factors regarding the *customer* which is involved, consisting of:

- The type of customer, where customers can be users, end users, existing customers, potential customers (new markets) or arbitrary individuals in this universe.
- The *expertise or competence of the customer*, necessary for an effective and efficient involvement.
- The *engagement of the customer into participation* by looking at the involvement, the influence, motivation and commitment required from the customers that participate, which depend on the perceived benefits of participating.

3. Aspects regarding the *process* of involvement:

- The *timing* of the involvement, i.e. the stages or phases of the innovation process, in which customer input is appropriate. An aspect that also has to be considered is the proper amount of participants to involve.
- The *roles and contributions* of the participating customers: which activities do they perform and conduct.
- The *mode and intensity of interactions and communication*: which communication channels are suited for involvement, who communicates with the customers and how intense and how frequent does this communication have to be.
- The *techniques and tools to support* customer involvement: which already used tools and techniques can be deployed, and which additional techniques have to be acquired and used.

Although some of the above elements of the framework are based on the concepts found by the above mentioned authors, some of them emerged from exploring co-creation examples and accompanying literature in our systematic review (see 3.4.5). Selection of them is based on the perceived relevance in explaining differences between cases and theory. Every aspect or element of this framework represents a 'scale' on which two or more outcome values are possible. In some cases the scale is nominal – e.g. on the market type scale we can distinguish either B2B, B2C, or not-for-profit organizations - in some cases ordinal – on the scale innovation novelty, for example, innovations can increase from incremental, via novel to radical ones – and in other cases ratio, e.g. the openness scale represents values ranging from minimally open (only one or two external participants) to fully open (infinite or many participants). Although this entails that there is an infinite amount of possible combinations, it is to be argued that there is a limited amount of optimal or ideal combinations. For instance, as we have seen in a previous review (sub section 4.4.4) radical innovations (novelty value) can be developed by customer co-creation in the early stages of the innovation process (timing value) if we ensure that we can access the customer knowledge (tool value) and preferably make use of a diverse set of customers (customer expertise value). In this way our design propositions can be developed, i.e. looking for and finding these optimal combinations for the framework scales.

However, it is yet too early to comply with this demand. We will need to study practice and theory more deeply to accomplish this activity of design proposition development. In the next chapter we will present and discuss a number of practice cases that have involved customers in the innovation process. Aside from describing these cases, we will also analyze them with this 3CI framework in order to determine some aggregate combinations which are useful for our design propositions.

# Chapter 5 Practice

## 5.1 Introduction to this chapter

In this chapter we will review some well known cases of customer co-creation in innovations in order to help us to develop our design propositions in the next chapters. We will make use of a variety of resources, such as magazines, books, and news, published or edited by practitioners, as well as data collected through expert interviews and our own experience. There are numerous recent cases described in non-academic literature - academic literature seems to be restricted to older situations. Over 50 more or less elaborately described cases were submitted to our review, but only a limited number of cases will be reviewed in this chapter. They have been selected on their alleged contribution to the development of our design propositions and their comprehensiveness. As stated in our research design (section 3.4) the selected case descriptions were submitted to an expert who has been involved in the execution or management of the relevant case or, when not available, to a company representative, in order to validate them. In addition to this 'member check' the case description has been triangulated with academic or independent publications on the same case. Therefore, case descriptions can be regarded as objective and reliable.

In describing the cases guidelines provided by Rowley (Rowley, 2002) were followed. The case description is anecdotal, but followed by an analysis based on the structure provided in the previous chapter, last section (4.13) – our so-called 3CI Framework – to which all other cases were also submitted. Each case review is preceded with a mention of relevant, primary data sources and a case background description. To exemplify the availability of an abundance of cases we have incorporated some brief descriptions of other cases in Appendix D, for which the description of the 3CI-framework analysis has been omitted.

## 5.2 Client Co-Creation Lab

### 5.2.1 Introduction and background

This case description is based on project material of the Client Co-Creation Lab project, conducted by Altuition in 2005 - 2006. In addition, one project participant was interviewed, and data was also collected from the author's own experience in the project.



**Figure 5-1: Logo of the Client Co-Creation Lab**

The initiative for the Client Co-Creation Lab (CCCL) came from Altuition, a consultancy firm based in 's-Hertogenbosch, the Netherlands that is specialized on renewal and improvement of customer interaction process for its clients. Altuition's clients reside in all kinds of businesses, whether B2B, B2C or not for profit, and sizes.

The focus of the Client Co-Creation Lab, an innovative consortium, was intended to lie in the development, programming and piloting of customer-driven innovation for the regional SME together with the Philips HomeLab. The CCCL was to become an expertise

center for the SME where the approach of co-creation was to be applied, i.e. product development by the SME in collaboration with their customers. SME's can involve their customers particularly in the generation of new concepts and the acquisition of the customers' deeper feelings and experiences of new and existing concepts. The project was to be executed to test the viability and exploitation possibilities of the CCCL for the SME.

In the context of the increasing interest for open innovation projects by many Dutch firms in the period of 2004 and beyond, Philips Research was also looking around for external parties for open innovation, and was especially pleased and interested when hearing that the project concerns the SME in the Noord Brabant province of the Netherlands.

The concept CCCL emerged in negotiation meetings between Altuition and Philips. Content preparations for these negotiations were made by Altuition; about 5 meetings on several levels were needed. In these negotiations, High Tech Campus management in the person of the director was also involved.

Funds were raised by partial subsidy from Innovatieve Acties Brabant (IAB), a regional funding program, with cooperation from the Noord-Brabant Province, the Brabantse Ontwikkelingsmaatschappij (BOM) and the European Committee – a partner in the project.

## **Project Partners**

### ***High Tech Campus Eindhoven***

High Tech Campus Eindhoven is an idea of Philips and was established in 1998. The campus is intended to facilitate high tech companies all over the world to concentrate their R&D efforts, with the aim of Open Innovation. The High Tech Campus is an independently managed facility manager for such companies by sharing of special buildings, equipment, services and eventually, knowledge. By sharing these facilities between habitant companies, numerous possibilities for collaboration, joint ventures, partnerships, and such are created.



**Figure 5-2: High Tech Campus Eindhoven (source: [www.hightechcampus.nl](http://www.hightechcampus.nl))**



At the time the project took place (2005) the area consisted of over 30 new buildings, with an ongoing construction of new buildings. Several renowned companies from over 50 different nationalities like Philips Research, NXP, ASML, and IBM have “positioned” themselves on this location where about 40% of all R&D activities in the Netherlands take place. On the campus a variety of facilities & equipment are available, such as the Devices Technology Services (prototype realisation on thin film samples and displays (Display Workshop) in the research and pre-pilot phase to support the design and release of processes and devices , use of facilities and equipment for research experimentation (clean room technical services, gas analysis services, process equipment support) , with respect to complex mechatronic systems, services offered include system definitions, design, realisation, testing, repair and maintenance after system delivery; Prototyping & instrumentation: advise, design, produce, test and resource prototyping products or systems with hardware and software components; Computer services: a portfolio of ICT services including ICT infrastructure, application, business information systems, library and documentation, one of Europe’s best audio- and video infrastructures; Center for Technical Training: specialized courses on technology & quality management, electronics & optics, IT, mechatronics & manufacturing; EMC Competence Centre: supports innovation with competencies and services in the field of EMC and EMF.

### ***Philips Research***

Philips Research, founded in Eindhoven in 1914, belongs to the largest R&D organizations in the world. It exploits the HomeLab as an experience prototype center and research facility of Philips. A division of Philips Research is the Philips Research Services, where third party organizations and firms are facilitated with technological facilities and capacities for product development and research. One can think of clean rooms, material research, and prototyping.



**Figure 5-3: Impression of the HomeLab**

One of the typical Philips Research’s facilities is the HomeLab. The Philips HomeLab looks and feels like a regular home with modern furniture in every room, Van Gogh prints on the walls, and even a fully stocked kitchen. While no one lives at Philips HomeLab, temporary “residents” can stay at the facility for anywhere from 24 hours to two weeks, depending on the type of research being conducted. During their residence, individuals or families will go about life as usual, while interacting with the new technologies Philips has installed as prototypes in the facility. The prototypes range from electronics that recognize your voice and movement to digital displays within the bathroom mirror to new “toys” that help will children expand their creativity.

Philips researchers will carefully watch how their tenants are living with these technologies 24 hours a day through tiny cameras, microphones and two-way mirrors that are hidden unobtrusively throughout HomeLab. According to the scientists who developed Philips HomeLab, being able to study people in their natural home environment for long stretches of time will help them to develop better products, faster.

It gives them a true sense of how people are interacting with technology beyond the initial “newness” euphoria, and the test subjects act naturally because they are in a comfortable home setting — not a “stuffy laboratory”.

### ***Altuition***

Altuition is a consultancy specialized in the renewal and implementation of commercial strategy and processes for its clients, by supporting its clients to better listen to their customers. Altuition was founded in 1997 and consisted of 12 consultants in 2005. This organization advises and supports firms in the financial and business-to-business services industry as well as governmental organizations and production firms. Altuition is specialized in process analyses in commercial projects, thereby directing attention to the customers. Altuition goes beyond traditional marketing research methods. The organization uses innovative methods to find out unconscious/underlying customers' needs and emotions, like the Zaltman Metaphor Elicitation Technique (see Appendix E). Altuition uses her knowledge with respect to the renewal of commercial processes to create a customer fit (a balance between what a customer wants and the capabilities of an organization). Creativity and learning are key concepts in this organization. Currently, they are using methods that give small groups of customers the opportunity to express their opinion and needs to an organization.

Altuition is one of the co-founders of this project, but also acts as project-executor and project manager.

### ***Regional Employers Association (Brabants-Zeeuwse Werkgeversvereniging)***

The “Brabant-Zeeuwse Werkgeversvereniging” (BZW) is the regional collective for entrepreneurs and employers in the Southern Netherlands, covering the provinces Noord Brabant and Zeeland, and the regional network of the national collective for employers, the VNO-NCW. The largest companies in Brabant and Zeeland are members of BZW, but also medium and smaller companies feel at home. With 3000 executive members from over 1900 companies, BZW is a significant factor in the regional and rural economy. Through its power of the collective the BZW acts as an advocate for its members in political, economic and social situations and challenges. Simultaneously, the association is an inspiring place for meeting and collaboration.

BZW is important for encouraging innovation in firms. This includes ensuring that resources are available for companies in order for innovations to be customer-driven. The BZW has declared on behalf of its members to be interested in participation in the project. BZW proposed to assist in approaching its members to participate in the pilot. BZW thus assumed the role of partner and linking pin in promoting and communicating to the regional SMEs. BZW's involvement was of particular importance because its members consist of many SMEs in the Brabant region, the target group for this CCCL initiative.

## ***5.2.2 Case description***

### **Project objectives, goals, promotion and plan**

#### ***Project goals***

The actual start of the CCCL-project was in February 2005 with the grant of the Province of Noord-Brabant and the EU. Because of this international funding, agreement was reached on the following project goals and objectives:

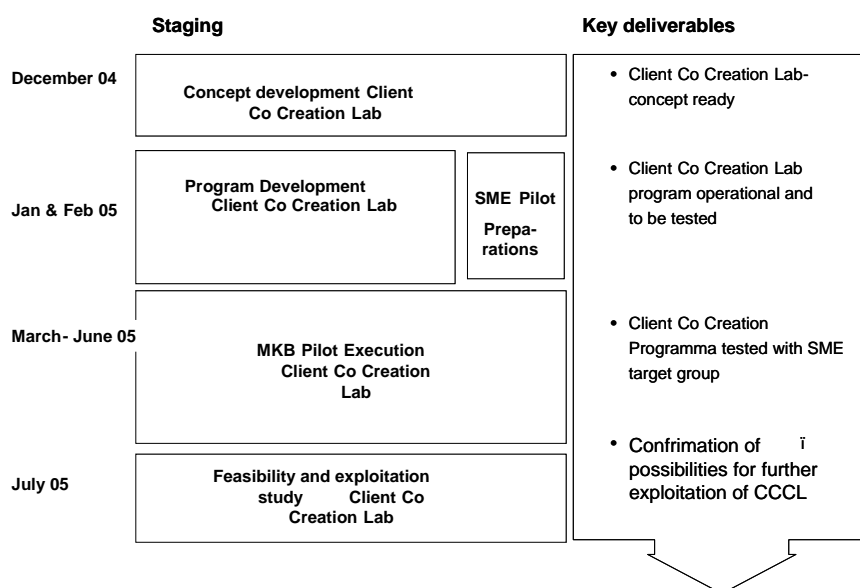
1. Development of the co-creation concept in collaboration with High Tech Campus Eindhoven, Philips Research Services, Philips HomeLab, Altuition and BZW.

2. Development of a co-creation lab with innovative facilities for the Brabant region SMEs.
3. Testing of this concept in about 10 pilot projects for Brabant SMEs.
4. Investigation of the feasibility and viability of the Co-Creation Lab after pilot completion, i.e. continuation of the concept.

### ***Project plan***

The project plan with activities and deliverables is depicted in Figure 5-4. This staging is congruent with the project goals. We will not elaborate on this plan because of its lesser relevance for our research purpose in this thesis. And, although the final phase (Investigation on the continuation of CCCL) is not within the scope of this thesis, we will address some of the findings of this stage in the project. Activities that were carried out were: an evaluation of the program content; a feasibility study with a business casing of the CCCL; a study into the Open Innovation service propositions of Philips research towards SME companies; an investigation into the funding possibilities of the CCCL by project partners. Three possible scenarios for the future were developed, one which addressed the issue of funding and financing of the concept, one that focused on the content actualization of the CCCL, and a last scenario that subjected the business model, all with an emphasis on assisting and supporting regional SMEs in their innovation efforts. We will suffice by stating that these resulted in a follow up which is currently being implemented, in which HTC Eindhoven operates as a connection center for SMEs looking for support and assistance in their innovation efforts. Assistance can be brokered by HTC and Altuition, support is provided by HTC inhabitants with equipment, facilities or technology. We observe that this concept goes beyond customer involvement – it focuses more on Open Innovation possibilities and opportunities for the SME. Aside from these developments, the project also resulted in a shortlist of companies interested in a co-creation session after project ending.

The project came to an end in January 2006; the final report was submitted in February of that same year. A grand total of 16 pilot sessions for 5 pilot SMEs were executed.



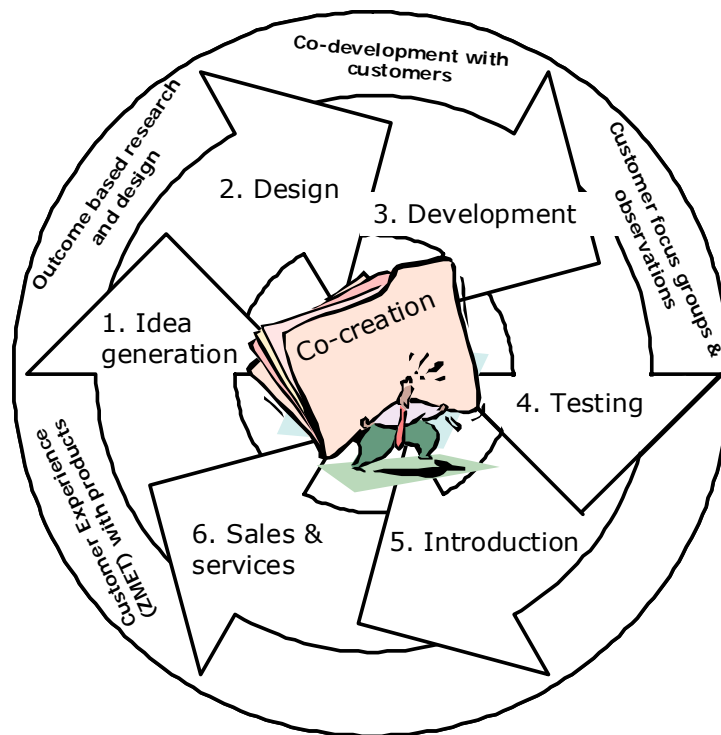
**Figure 5-4: Staging of the CCCL-project**

### **The target group: SME-companies in the region Noord-Brabant**

SME- companies usually encounter major practical problems when innovating (Scozzi et al., 2005), because of a lack of either resources, as testing or prototyping facilities, sufficient budgets to conduct proper market research and customers' needs investigations, or a lack of knowledge of the proper methods and techniques to apply in especially the interface activities with customers, like needs assessment, concept testing, or a lack of both, resulting in insufficient funding or capabilities to develop their new products or services. By involving these companies in the Co-Creation Lab in an early as possible stage, the emergence of such problems can be prevented, since the CCCL can easily bring these companies in contact with either partners or potential customers. Technological know-how is rarely developed in house by SMEs: it is mainly acquired by purchasing hardware and software technologies or by accessing external laboratories (Scozzi et al., 2005). Cost has been cited and found as one of the most significant barriers to innovation for SMEs (Madrid-Guijarro et al., 2009).

The CCCL intended to focus on especially those SME-companies in the Noord-Brabant region of the Netherlands, which had the need to try out a new or existing idea or concept with their customers, but which didn't have the necessary facilities and knowledge available themselves to conduct this.

#### ***Support and assistance for the target group***



**Figure 5-5: Co-creation services of the CCCL in 4 process stages**

The CCCL was designed to assist participating SMEs in one or more stages of the innovation process with (see Figure 5-5):

- Customer co-creation in the ideation stage: generating new product or service ideas with customers;

- Customer co-creation in the design stage: designing new product concepts with the customer;
- Customer co-creation in the development stage: involving customers in the ongoing development of a new concept;
- Customer co-creation in the test stage: product and concept testing with customers.

The SME would be able to choose to be assisted throughout the whole process, as depicted above, or for just one or two stages where customer involvement is expected to be of importance. Assistance was provided in the CCCL facilities and by the CCCL tools. This support was estimated to be sufficient to acquire guidance by e.g. Syntens or one of the CCCL project partners, e.g. the Technology Liaison Office of the HTC. However, after the CCCL Concept development stage, a remarkable choice was made to restrict the lab sessions for the pilots to product, concept or prototype testing, in order to limit the investment that participating SMEs have to make. There were no explicit activities programmed to engage with customers in ideation and product development. However, it was agreed on to not neglect such possible customer input in case the customers came with ideas, product suggestions and such.

### ***The role of customers, interaction and contributions***

The goal of the project was to acquire about 10 SMEs that wanted to co-create with their (potential) customers. For every pilot a brief research program of 1 to 2 days was established, consisting of several steps. Within that program the HomeLab session is conducted, in which customers, mostly families, youngsters, elderlies, and such are intensely engaged with tasks and inquiries. This is analyzed and reported, for an important part by video recordings of these sessions. The standardized CCCL protocol for the interaction with participating customers is depicted in Box 5-1.

As can be observed from the expected customer contributions, the use of the HomeLab, and the interaction protocol in Box 5-1 it can already be observed that physical presence of customers was essential in the project. Having the participants over for half a day and interviewing and escorting them individually by a facilitator and moderator exemplified the close and intense interaction during their participation and contribution. All participating customers received an invitation letter. In those cases where children were involved, explicit consent from the parents was acquired (written consent).

### ***Recruiting the SMEs***

To check the suitability of the interested SMEs 6 interviews with SME-entrepreneurs were conducted in order (1) to establish the needs of the entrepreneur in the development of new products and services, especially in the stages of idea generation, design, development, and testing; (2) to establish whether and how potential customers and the HomeLab can play a role in the different NPD-stages. An additional goal was to see whether there existed any possibilities for other research facilities than the HomeLab. It was aimed at particularly technical installation companies (lighting systems, ventilation systems, and domotics), firms with innovative consumer product (prototype testing), marketing and advertising agencies, retailers of consumer electronics. Companies were selected from BZW-members and through the Chamber of Commerce, where especially was searched for start ups, and contacts from a previous project by Altuition, (Klantenleercentrum). They were approached by letter, followed by an appointment for a one hour interview. The entrepreneurs were interviewed and an inventory was made with a checklist, describing the products or services, their use and use context, existing ideas for new products or services and the standing process for NPD or NSD. Interested and qualifying parties were listed for an eventual follow on as a participant.

***Client Co-Creation Lab Protocol for participating customers***

**Telephone recruitment**

**Invitation letter**

**Reception:** in reception room

First, real reception; indicate to participants that will be video recorded when entering.

**Filmed entrance:** reception

- Explain the logistics: until 18:00h; dinner at 17:10h
- Reconfirm confidentiality, have them sign disclaimer
- Show camera and microphone positions, explain them, observation room
- Any questions?

**Exercise I:**

[General warming up for research subject]

"What are your thoughts and feelings on ...< research subject >?"

**Collect four pictures representing these thoughts and feelings.**

***Apply probes***

**Exercise II:**

Imagine a typical evening at home, after work, at dinner ... < scenarios >

Now, let's adapt this situation:

- Suppose ... < introduce test subject >
- Think aloud how this might affect your previous scenario

**Debriefing:**

Are there any other thoughts and feelings that might be important, but that you haven't mentioned?

Summarize the first impressions and insights in respondent's own words.

**Closure:**

[Thank for cooperation; hand over incentive; any questions? Ask for feedback. Escort to exit.]

<End of recordings>

**Box 5-1: CCCL Protocol for interactions with participating customers**

It is evident that because of the use of the HomeLab – an imitation of home environment - pilots were restricted to SMEs aiming at the consumer market companies, and particularly for products and services used in a home or living context. Therefore, not all SMEs were eligible for participation. In those cases where it is not possible to give the proper support to the SME within the Brabant region, SMEs can use their Innovation Voucher, provided by the Dutch government, to acquire assistance from other R&D facilities. It may be obvious that this will be applicable for technology oriented or following SMEs.

In the Program Development for the Client Co-Creation Lab (Phase 2) stage of the project it was the goal to acquire sufficient participating SMEs (about 10) to test the concept of the CCCL, to develop a program for the execution of these pilots. Agreements were reached to acquire participants from the BZW member list for which several media were used, as mentioned in the communication plan, as well as a selective mail campaign to BZW-members and through PR and acquisition meetings by Syntens, Bureau Horizon, and UniTilburg MKB –loket. Two special events are mentioned here because of their propaganda characteristic. On June 16, 2005 some workshops on and about the CCCL were organized for the Faces of Innovation conference. Two workshops were presented with a total attendance of about 50 entrepreneurs. In these workshops the concept of the

CCCL was explained, supported by the video, followed by a discussion among the attendants. Business cards were collected, and about ten SMEs received a call, from which one participant emerged. On October 4, 2005, Flevum organized a national convention on Open Innovation & New Products at the High Tech Campus Eindhoven. The CCCL was present with an advertising banner and showed the video trailer continuously.

In addition, a set of procedures and protocols were developed for an intake for participating SMEs, guiding the SME representatives throughout the whole process ("code of conduct"), the reporting of pilot results and a potential implementation plan for the participating SMEs.

### ***Techniques and tools to support CI***

In a research most of the SME firms mentioned that they do not adopt structured techniques or standard procedures to monitor the market (customer needs, technological advancements and computer performance), develop an innovation strategy or control the innovation process (Scozzi et al., 2005).

A first step in the starting stage of the project was to make inventory of available tools and techniques to support the co-creation activities for SMEs with their customers. Within the CCCL several methods, techniques and tools were available, although dispersed among the partners. The inventory was conducted by the following steps: (1) a matrix was created in which the co-creation steps were noted in the vertically and the available techniques and tools, horizontally; (2) next, the matrix was filled by asking the following question: which concrete applications can be found for a cell, resulting in a tool or technique; (3) for each combination or possible technique the facility requirements are derived and checked against the HomeLab facility features, with the augmentation of the requirements whenever a gap was discovered; (4) valuation of each possible technique through PMI (de Bono, 1995) by all project partners; (5) finalization of this list in the CCCL Toolbox. See Table 5-1.

NPD-stage	Tools & techniques	Application	Results
New product ideas, Ideation	Mini scenarios with theme charts Storytelling	5 participants, individually 10 minutes Participants, designers and facilitator together, 50 min.	New product ideas within a category Validation of existing ideas
Product idea Prototype on paper (2D)	Mini scenarios with theme charts Storytelling	5 participants, individually 10 minutes Participants, designers and facilitator together, 50 min.	Use context of a product Suggestion for functionalities and attributes
Physical prototype (3D)	Brainstorming between users 'Low-fi' prototyping  Storytelling	5 participants together, 30 minutes 5 participants together, 40 minutes Participants, designers and facilitator together, 40 min.	Use context of a product New functionalities and attributes for a product Validation of existing functionalities and product attributes
Functional (80%) prototype (4D)	Brainstorming between users Usability test  Storytelling	5 participants together, 30 minutes 5 participants together, 40 minutes Participants, designers and facilitator together, 40 min.	Satisfaction check Practical implications for use

**Table 5-1: Available CCCL Tools and Techniques**

The 6 SME interview results in the concept development phase were incorporated in this toolbox, and a concept program was developed and test run was conducted with this concept with a former Altuition client, the firm Hoogspoor, located in Tilburg, and

specialized in domotics, lighting and illumination plans and systems. The reason to involve a former client was because of the ease of acquisition and the propensity of this client to cooperate because of former experiences with Altuition. The earlier mentioned video to interest possible participants was an edited recording of this test session. The results of this test run resulted in some necessary adaptations of the concept program, named Client Co-Creation Lab Protocol, which was approved by the project partners, see Box 5-2.

<b>Client Co-Creation Lab Program for Clients</b>	
Step 1: Preparation of an client-specific program through 2 intakes and the selection of participating customers:	
<ul style="list-style-type: none"> <li>▪ Setting boundaries: amount of participants (5-10 customers), context (in-home situations)</li> <li>▪ Making acquaintance with client's goals, objectives in the pilot</li> <li>▪ Making inventory of product, concept or prototype features, functions, attributes, design intentions, ...</li> <li>▪ Determining the question, challenge or task for participating customer(s)</li> <li>▪ Detailing of the Lab session: moments and to expose participants to concept, product, prototype</li> <li>▪ Selection and invitation of participating customers</li> </ul>	
Step 2: Lab Session Execution	
<ul style="list-style-type: none"> <li>▪ Walkthrough the HomeLab with (paper) prototype: customer tour through the rooms of the HomeLab, holding or carrying the prototype or concept and tell aloud what their intentions would be in that particular room and how they envision the use of the product. Client SME observes.</li> <li>▪ Usability session: using the prototype in specific contexts. SME client observes.</li> <li>▪ Review: SME client's designers/developers walk through the HomeLab with customer to illustrate unused prototype features or functions, and to discuss probable unattended attributes. Facilitator observes.</li> </ul>	
Step 3: HTC Session: facilitated workshop for SME client and designers to discuss outcomes:	
<ul style="list-style-type: none"> <li>▪ Session debriefing</li> <li>▪ Prototype debriefing: strong and weak features, missing features.</li> <li>▪ Stumble-on insights: surprises, latent and unattended needs and wants</li> <li>▪ Session evaluation</li> </ul>	

**Box 5-2: CCCL Program for SME-clients**

## Pilots

From the list of about 100 SMEs that were reached, 60 received a follow up call, resulting in 30 appointments, from which 5 pilot clients were acquired, entailing a total of 16 co-creation sessions in the HomeLab. What emerged as a problem was that most of the interested SMEs were not able to have the sessions conducted within two weeks, as was aimed, due to facility availability of the HomeLab. Most of them needed more than the two weeks to discuss the pilot internally and plan for the research challenges they had. Most pilots could be planned in the months of October, November and December of 2005. Among the companies that agreed on this participation were domotics manufacturer (Hoogspoor), a newspaper publisher (Brabants Dagblad), 2 software developers for care applications (Ictus, Magister), and a catalogue warehouse (which we call eCatalog). These companies agreed on the conduct of a total 16 pilots – some clients opted in for 2 or more pilots.

Acquisition of these pilots did not go without troubles. Although most prospects valued the concept of the Co-Creation Lab because it addressed the elicitation of deep and latent customer needs and the involvement of customers, not all were able to see how this concept of involvement in the HomeLab should be translated into their own strategy and



procedures in NPD. As came out, the real reason for this inability was that several companies typically did not have any test ready idea, prototype or product at that time or in the near future. Others were already familiar with the concept. For instance, a security company mentioned to dispose of a Security lab in which security and safety equipment, procedures and systems can be tested and learned. In addition, many SMEs were not quick deciders – it took about 5 to 12 weeks from the first contact through the intake (start of the program). And although client SMEs were required to co-fund the pilot with a fixed budget, in general this requirement did not seem to pose an obstacle at all – most prospects opinioned that this financial contribution was below their expectancy and that twice the amount seemed fairer.

Pilots were executed in the period of October through December 2005. Part of the program was also an evaluation of the co-creation pilot, for which a report was drafted and presented by the project partner Altuition. All participating SMEs which received such a report expressed their enthusiasm about the results, which seem to live up to their expectations. They all expected to make useful use of these results for business purposes. Because of a strategic choice to limit the lab sessions for the pilots to product, concept or prototype testing, in order to limit the investment that participating SMEs have to make, all innovations, new products and new services were company initiated. This means that all pilot companies were already in the process of developing a new service or product, or had a product or service idea that needed to be tested. Although the CCCL concept provided in a support of customer initiated ideas and products, this possibility was not tested and exploited in the pilot phase. As noted above, acquisition was hampered because of this, because several companies typically did not have any test ready idea, prototype or product at that time or in the near future.

### ***Magister***

Magister is an ERP systems developer for meal distributions in Veldhoven, the Netherlands, with about 20 employees. For the CCCL pilot Magister opted to test a dieting and meal distribution system, developed for hospital care, in a home care environment. It concerns a digitalized system with which hospital patients make the choices for their daily meals and which takes their diet restrictions into account. Magister wanted to test what adaptations were needed to make its digital meal distribution system compliant for applications in which the disabled or sick that receive home care. This was a special challenge because patients could not fall back on hospital assistance in case of questions or problems. Magister had the following test requirements: (1) it wanted to replace the touch screen monitors, currently in use, with Philips monitors and in the end on standard TV screens. The company wanted to know how this would be perceived by users; (2) two use contexts were indicated: one in which the patient has a partner, and one for a person living alone. Magister wanted to see what the customers' needs were in both situations. To meet the second requirement, two co-creation sessions were designed, to take place on the same day – one in the morning, the other in the afternoon. It was however, not possible to develop a TV application on short notice, so the test was restricted to a monitor. Research question was to investigate whether home care patients are able to eat what they liked and needed. The aim (outcome benefit) was to make home care patients with a special diet as self supporting as possible and to maintain their current lifestyle by matching what they want to eat to what they are permitted and required to eat. Additional research question were what is needed to make patients understand and apply the concept autonomously, but also to see which additional services one could think of, e.g. pizza ordering and delivery.

Magister had two sessions conducted with three elder participants, one with a married couple, and the other with a single. They were selected by Magister; Altuition provided them with instructions to prepare for the sessions. Both sessions were conducted on the same day. Magister supplied the incentives for participating customers, which were

administered at the end of the session. The program consisted of a reception and a short tour through the HomeLab to get acquainted with furnishing and equipment, e.g. TV. The main goal of this was to make participants at ease and feel at home. This introduction was followed by an in-depth interview, based on ZMET™, to probe for metaphors that elicit participants' deeper and latent feelings on lifestyle and nourishment. This interview was conducted in the dining room, seated at the dining table. The interview lasted 3 quarters of an hour. Following this interview, respondents were requested to compose their daily groceries shopping list, by rummaging through the kitchen and dining room. While composing they were probed for their motivations and reasons for particular products. They were also questioned about the locations they usually acquire these products. After a short break, used to install the Magister system, the respondent was introduced to the system with a short tutoring. They were then requested to remake their shopping list using the system. They were requested to think aloud when making their choices and using the system to elicit compliance with their inner thoughts and feelings. Next, they were supposed to use the other services the system provides, and, again by thinking aloud they communicated their findings. The session ended with a reflective interview in which participants were exposed to some initial analysis of the activities, like similarities and differences with the depth interview, paradoxes observed, and such. The respondent was thanked and administered the incentive. The whole session lasted approximately 3 hours. All conversations with and activities of the respondent were video recorded.

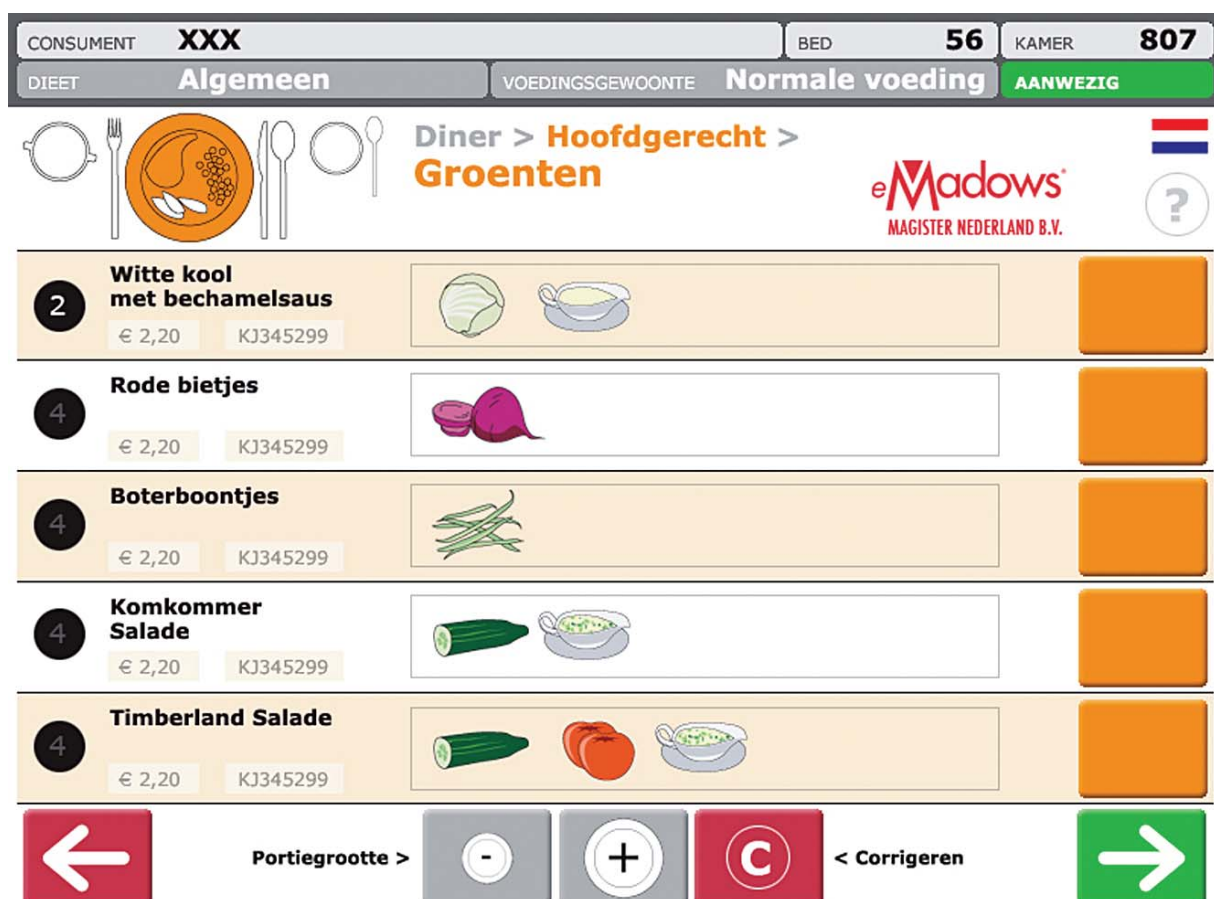


Figure 5-6: The digital menu developed by Magister (source: van Eerden, 2006)

Wim Goris, CEO of Magister reacted on the results by stating that the sessions had contributed substantially by reducing development time, risks of market failure and commercialization cost. In addition, the company it emerged that the imaging and

presentation of the system are important features, especially with concern of language (van Eerden, 2006).

### ***Ictus***

Ictus is a consultancy in policy and societal issues regarding medical and paramedical care. With the pilot in the CCCL Ictus had the intention to check what information provision and management regarding diabetes for patients in order to achieve a high level of self support. Ictus maintained some hypotheses on how to achieve this autonomy, which included working conditions, health insurance conditions, eating habits, and a foot scanner, and wanted to test these hypotheses. Results of the Ictus pilot culminated in a comprehensive view on how diabetics deal with and use information concerning their disease. It also provided the necessary input regarding the 'concepts' tested, such as the foot scanner, work environment, the role of health insurance companies, and nourishment habits of a diabetic.

Four individual interviews, each with one diabetic patient, and one group session with four patients were conducted. In total 8 diabetics, ranging from 25 to 75 years of age, four male and four female, participated. Participants were selected and invited by phone by Ictus. The appointment was confirmed by letter. A follow up phone call was carried out to verify participation. The program consisted of both individual and group interviews, supported by cultural probes such as diaries and pictures to prepare participants for the interview, and interviewing in the HomeLab to simulate home environment. When recruited, participating diabetics were sent, a week before the interview, a disposable camera and were requested to take pictures of situations, in all contexts (at home, at work, when going out, etc.) reflecting on how they maintain themselves as a diabetic in these contexts. Respondents for the Ictus pilot appreciated this home environment, because they were able to feel at ease and talk in all freedom about sensitive subjects, like tensions at work.

Ictus' enthusiasm about the pilot's outcomes resulted in the national presentation of the findings to the CVZ, the Dutch governmental health care insurance supervisor. Ictus' representative, Peter Ragetlie admits to being surprised that diabetes patients were very open and receptive to take more control and tasks in their own treatment, although many were not aware of the possibilities to do so, or needed some encouragement in self support (van Eerden, 2006).

### ***eCatalog***

ECatalog is a German founded catalogue and online retailer for home shopping, with a division in the Netherlands, based in Tilburg. The company has a business model similar to the renowned American organization of Sears, in which people have the possibility to order clothing, apparel, electric and electronic appliance, toys, and many other products by means of a quarterly published catalogue or an online shop. People can order either by mail, telephone or online by simply providing the article number, size and color code, and the requested quantity.

eCatalog did not have any innovation, but wanted to test their internet-based catalogue in consumer surroundings. The pilot demonstrated the importance of the online configurator and ordering module for decision making in families, the division of tasks and interaction in selecting and ordering products between males and females in families, the synergy that emerges from the combination of a physical catalogue and online tool, and role of pricing in its services. eCatalog engaged with the CCCL because it wanted to understand in which its customers uses the catalogue and the online application when choosing and ordering. It also wanted to see how its service was perceived by customers.

eCatalog decided, on advice from the project team, to recruit 4 families, each consisting of parents and two children in the age range of 13 to 18 years. The latter because of the emerging fashion and clothing awareness that children of such an age experience. Recruitment of the participating families was conducted by telephone, using eCatalog's customer base (existing customer). Because of the centralized location they were families that lived in the surroundings of Eindhoven, but it was agreed on to compensate travel expenses. Customers were called at random, informed about the intentions of eCatalog with such a session, and through a short survey it was determined whether they fitted the required profile for participation concerning their online shopping behavior, i.e. participants had to be eCatalog users, but shopping at competitive shops was welcome. On compliance, they were requested to participate. Participants were also told to receive an incentive on completion of the participation, but they received no clue of the value of this incentive.

In the eCatalog pilot participants were contacted by telephone, probing for their inclination to participate. After the family was recruited and date and time of participation were set, they received a confirmation letter and a disposable camera. The letter contained instructions for the lab session and the participants' preparation on this session. They were requested to take several pictures showing their activities and engagement regarding situations of home shopping. The camera was intended to take the pictures with. Upon completion of picture taking, respondent had to send in the camera in order to have the films developed and printed in time for the session. One of the recruited families failed to be present on the agreed date because of unknown reasons. The remaining and participating families visited the HomeLab for half a day in December 2005, where the following protocol was executed. After arrival the family got acquainted with the HomeLab dwelling facilities and equipment. This was followed by an interview with the complete family, in which the customer journey of receiving the catalogue till order submission was discussed. Questions were looking for the one(s) that first opened and researched the catalogue, the subjects of primary interest, the time of the day that this takes place, the decision process in choosing products to be ordered, the role and support one gets from the internet, the delay between the research and the ordering, the one(s) that fill out and submit the order form, the influence one gets in the own decision or has on others' decisions, and the way this influence is administered. From this interview a typical scenario, in which preferably the whole family is involved – in the case this is not possible the family members are requested to each simulate an own scenario –, is elected and simulated, e.g. Thursday evening after dinner, before watching TV, discussing the things to order with eCatalog. This scenario is carried out by the family members, who are requested to think out loud. After the scenario runs, the whole family gathered together and in an interview, conducted by the facilitator the whole of findings was reflected on, where it was the intention to elaborate on unelicited topics, the discussion of apparent paradoxes in behavior and motivations, and such. The session was video recorded to enable afterward analysis

### ***e-Newspaper***

In the e-Newspaper pilot we see collaboration between several organizations to test a new concept of newspaper reading by consumers. Brabants Dagblad en De Twentsche Courant Tubantia, regional newspapers in the Netherlands and subsidiaries of Wegener Dagbladen, a national newspaper publisher.

In the e-Newspaper pilot we see two regional newspapers wanting to see if the future of newspaper beholds electronic versions. Since the rise of the Internet and the possibilities of continuous connectedness, newspapers encountered a noticeable decline in subscriptions, although many elderly consumers still prefer the paper version for news reading. To see whether electronic publishing, in whatever mode, can propose an alternative to paper version, the publisher started a joint development with an e-reader

manufacturer, iRex Technologies to explore the possibilities of news reading via an e-reader. Because Philips and another company were also in the process of developing an e-reader a second prototype was brought in to be tested. In fact, two innovation questions were at stake: (1) what does the future of news consumption behold, and (2) do e-readers offer a viable and sufficient alternative to paper news. Therefore the pilot was designed to find out how news is to be offered to consumers in the future, especially to the younger people. During this exploration of future news consumption, the two e-reader prototypes were to be tested.

In the eNewspaper pilot it was decided to involve four families, consisting of 2 parents and 2 children in the age of 13 to 18 years, in this pilot. They were recruited from Brabant Dagblad's subscriptions. Participants were sent a disposable camera and were invited to take pictures of their current news consuming behavior at home. The camera was returned and pictures developed, and used as elicitor during lab session interviews. Two families were exposed to the Radius e-reader, and the other two to the iRex. A total of four lab sessions were conducted. The program for the HomeLab session was similar to the other pilots: an introduction to HomeLab facilities, a group interview on news consumption to find out which, why, when, where and how news is consumed by individual family members by using the respondent made pictures as an elicitor, selection of a scenario in which the role of an e-reader is tested. In addition, a future scenario is executed, where respondents are requested to imagine themselves in the future with an abundant availability of technologies to consume news. They are then requested to envision some of these possibilities for news offering, avoiding the detailing of the technologies. They are then requested to use the e-reader in this context, and by thinking out loud, they can articulate their positive and negative experience of this technology. As with all other pilots, the session ends with an evaluation of what has been said, paradoxes are discussed, and so on. All sessions were video recorded for later analysis.

The results of the eNewsreader pilot showed that news consumption in families contributes to the social bonding within these families, e.g. discussing what had happened during dinner, as well as maintaining social relationships with one's social network, especially for the younger respondents, who indicated that recognition and belonging are important in their networks. The test of the e-readers resulted in mixed outcomes. On the one hand, respondents were enthusiastic about the technology, but on the other hand, the usability depends much on how the news is presented. Respondents seem to prefer overview (headlines, clustered to subject) as well as finity, in contrast to how most internet news is offered with all the deep linking and list of related news. One of the respondents: „Zo'n medium zou ik briljant vinden. Veel beter dan een papieren krant." (van Hoek, 2006).

### ***5.2.3 Key learning points***

Although the project partners and participating pilot companies were convinced of the benefits and contributions of customer involvement and content with its results, not all pilots or activities went without the necessary troubles and obstacles. We will discuss some of the findings in this sub section. First we will summarize the key findings of the CI-framework analysis, followed by the case specific issues and problems.

#### **Context for customer involvement**

As has been observed, the pilot companies in the CCCL case were all SMEs, but operating in diverse industries. We saw a domotic systems integrator, a newspaper publisher, an apparel and clothing seller, an ERP systems developer and a consultancy on social care policies and issues, supporting the idea that all type of industries can involve their customers in innovations. All companies operated in the Netherlands and more

specifically in the Brabant region of the country and had a diverse customer base, which can be typed as heterogeneous. The new products and services that were tested and evaluated in the CCCL were all, although technology-based, from all possible categories. On the one hand we could see incremental innovations or line extensions (eCatalog, Magister), but there were also more novel and radical innovations (eNewsreader, Ictus). Similarly, we observed both product (eNewsreader, Hoogspoor) and service innovations (Magister, Ictus), although the distinction is difficult to make. And as for the openness, the eNewsreader innovation was clearly an example of a closed mode of participation where secrecy and non disclosure were important requirements set by the pilot companies, whereas the other innovations were more of open mode participation. All innovations were, in addition, company-initiated, although the Ictus and eCatalog cases were also looking for possible new, 'raw' ideas, emerging from customer consultation.

### **Customers which are involved**

In all cases the end users were involved. As has been discussed previously this was intentional, since the CCCL was based on the presumption that end users know the use context of the products and services best. In all cases the end users were 'ordinary' consumers with no specific technology knowledge, although the innovations were technology based and not all pilot companies operated in the B2C market (e.g. Ictus is a consultancy advising governmental and care institutions). The CCCL concept demonstrated that involvement of end users can indeed be beneficial to and feasible for customers that want to. In all cases the aim was to involve 4 to 6 participants. This choice was made because of budgetary requirements. And although the participating companies were all enthusiastic about the outcomes, we have to observe that the representativeness of these outcomes is debatable because of the small amount of participating customers. Participants were contacted in advance by the pilot companies to ensure that participation was grounded in voluntarism trust and benevolence from the customers toward the company – as an indication of a good relationship. In most cases the participants were not promised any reward or did not receive a clue about the kind of reward in advance, to prevent people from being motivated to participate because of an extrinsic reward.

### **Process of involvement**

As observed, in the pilot the CCL assistance was restricted to the implementation stage of the innovation process, in particular to the testing of concepts and prototypes. Because of this customer input was also limited to giving feedback when using the prototypes. Incidental, some participants also provided ideas to surpass use problems, but usually these were not of a radical kind. Because of the choice for the HomeLab, customers had to be physically present during the participation, typically for half a day, entailing a high intensity of individual interaction during that period – a facilitator and moderator was appointed to escort and interview participants. In some cases participants received a camera in advance with the assignment to take pictures of the product (category) use context (cultural probes). Interviews were conducted based on these images they brought in, looking for metaphors that can be useful to better understand the participant's thoughts and feelings. Prototype testing was conducted by observing (with cameras) the participant's behavior during use of the prototype, followed by a debriefing interview.

### **Project specific issues**

#### ***Importance of preparations for CI***

Because of its experimental, novel and developmental character a lot of searching and testing had to be done in order to obtain a standardized protocol for the CCCL Lab. This search and test required time, dedication and expertise for the partners involved. Our learning from this would be that it is necessary to prepare a CI-project thoroughly by

deciding on matters as the timing of involvement, the openness of the participation, determining customers' contributions, and selecting the appropriate tools and techniques to be used in advance, when enrolling in CI for the first time. Once a protocol or an approach is established and the first project experience has been evaluated, next projects will be easier to prepare and plan, although preparation will remain important.

### ***Customers as a valuable source for innovations***

Most pilot companies indicated to be satisfied by the pilot results and the concept in general. In many ways the CCCL introduced new and valuable insights, as well as new techniques for the innovation process. Diary research, ZMET™, culture probing through pictures, think aloud techniques were tested and found to lead to satisfactory insights. Also, the customer co-creation concept was found to add value to companies' innovation processes. Nevertheless, in spite of these findings, acquisition of participating SME clients was hard. Project budget was exceeded with about 40% conducting this project activity. As has been previously stated, most SMEs weren't ready to act on a short notice and needed time to find a proper NPD project for the pilot. This could be explained by the general assumption that SMEs are not systematic innovators, and have trouble to see how their NPD activities fit in the generally accepted stage-gate philosophy in NPD, but also that firms do not (yet) perceive their customers as an important and valuable source in NPD. This brings us to the insight that a customer orientation, serious intentions and a willingness to involve its customers in the innovation process of a firm are important requirements to successfully apply CI.

### ***Increasing efficiency***

As for the costs of a pilot, it has been shown that all pilots can be executed at a fair price for most SMEs. This is an indication of the viability of the CCCL as a business model in the future. We observe however that all pilots were mostly focused on a concept or prototype testing activity, restricting them to only a fraction of co-creation possibilities as anticipated in the start of the project. It would require the testing of other NPD stages and techniques to get an answer on the feasibility of the complete concept. Nevertheless, pilot companies all indicate to have obtained valuable inputs for their innovation – preventing market introduction failure – that otherwise could not have been acquired or at higher costs than with CI. We can therefore conclude that CI increases the efficiency of the innovation process.

### ***Availability of prototypes***

The project had an ambitious goal of a short execution time, restricting the time available to prepare the pilots upon agreement. An important aspect of this type of customer co-creation is that prototypes are available within reasonable days before the required date and time. Many SMEs indicated not to be able to fulfill this requirement, and therefore refrained from participation. But in those cases where agreement is reached, SMEs have to realize the importance of delivering in time. In one case this almost went wrong because the firm did not have its prototype ready in time. The session dates had to be re-planned with a month.

Because of the limited time there is to execute a lab session (3 to 4 hours) it was crucial to have short preparation times to install systems or equipment to be tested. In one case – Magister – the time needed was longer than anticipated, the issue being almost detrimental to the process. The pilots indicated showed that prototypes have to be operation ready and easy to install during a short break. In extreme cases preparation before the session can be considered, but the question arises to what extent this premature exposure to the prototype will disrupt the home contextual setting for the respondents that is aspired by conducting the sessions in the HomeLab. In these particular pilot cases prototypes were essential, because it was an important way to

understand users' unconscious needs and wants that are not reflected in functional requirements, so that timely adapting of product features is still possible.

### ***Co-creation concept is broad***

Co-creation is not restricted to collaboration from the firm with its customers, but also entails collaboration with the CCCL-originating parties, like Altuition, Philips Research, and BZW. The co-creation target can also be regarded from three perspectives:

- The co-creation of the CCCL by Altuition, Philips Research, High Tech Campus Eindhoven and the BZW.
- The co-creation of an innovation project by involved SMEs and Altuition / executing parties;
- The co-creation of a new product or service by the SME and one or more of their customers.

So it is co-creation in its broadest sense, as observed in sub-section 4.13.1

### ***Recruitment of participating customers***

In all cases recruitment of participating customers was done by the pilot SMEs themselves. The reason for this was that companies can best explain the necessity of participation and how they value customers' input. For customers this will look like a personal appeal which the company is doing on them. Most pilot SMEs, however, were not used to contact their own customers. This resulted in a very low conversion of recruitment calls. An alternative would be to outsource this recruitment to a professional recruiter. However, this also has its drawbacks, e.g. failure to recognize the importance because of being called by an unknown organization, the propensity to agree on participation because of the inherent incentive. In this project this has been avoided, and assistance was offered from the project team by scripting the recruitment calls.

It is also important to verify participation, i.e. calling the respondents a few days and a day before the session to check that they have not forgotten the appointment and have done their preparation tasks (taking pictures and sending in the camera). In addition, reception on the premises and in the building should also be prepared to avoid customers arriving too early getting lost or entering through a back door.

### ***Importance of a home context***

In the pilots, respondents seem to accustom fairly easy to the HomeLab, regarding it as a real home. This made it possible to proceed with all sessions in a reasonable time (3-4 hrs). However, the HomeLab is not really representative for one's own home, because of the installed modern technology. This could result in a possible distraction of participating consumers. The best solution would be to observe and interview participants in their private environment, i.e. performing ethnographic research in people's own home settings. However, this still will not avoid the possibility of bias in the obtained results. This is always a risk in lab settings.

### ***Confidentiality and IP protection***

In several pilots issues arose about the treatment of confidential information – in the eye of the pilot SME. Sometimes this confidentiality was needed because of IP-protection, as was the case in the e-Newspaper pilot. Between project partners and pilot companies this confidentiality was obtained by business agreements. However, pilot companies also required confidentiality from participating customers. To solve this problem, participants were required to sign a NDA in advance. But, to the extent in which this was a real



solution, questions remained in what way pilot companies or project partners could enforce this agreement. In one case, a pilot company was so distrustful of exposing ordinary consumers to its prototype that it chose to engage its own employees that fitted the required profile, assuming that this would make enforcement easier.

## **5.3 Douwe Egberts Coffee Systems**

### ***5.3.1 Introduction and background***

The following case is the description of an Altuition project conducted for Sara Lee/Douwe Egberts (DE) in 2006. The complete project consisted of two sub-projects, the first concerning the NPD for the mid-sized business clients of DE in the Netherlands, where the focus was on creating new innovative concepts for businesses serving drinks for their employees and customers – e.g. coffee machines in factories, offices, and cafeteria, as well as receptions, waiting rooms, etc. The approach and results of this first sub-project were presented at the Mass Customization and Personalization Conference in Helsinki, Finland in October 2009 (Weber, 2009a). The second sub-project was a similar approach, but now aimed at the NPD for the out-of-home segments, in which cafes, bars, and restaurants (CBR or BaReCa) act as the outlet of coffee and drinks towards consumers. We will focus on the second sub-project. This case description is based on project material from Altuition.

### ***5.3.2 Case description***

#### **Project objectives**

Douwe Egberts (DE) is a subsidiary of Sara Lee, and is located in Utrecht, the Netherlands, and has a primary product in coffee and tea. It is regarded as one of the largest fast moving consumer good (FMCG) companies in the Netherlands. It distributes its coffee and tea through retail channels (supermarkets, groceries, with a market share of 65%) directly to consumers, but also via outlets in the so-called out-of-home (OOH) channels, e.g. bars, (grand) cafes, restaurants, entertainment industries, fuel shops, and in businesses. While retail distribution is primarily focused on the distribution of coffee, tea, cocoa, and other drinks, which consumers prepare themselves with independent, third-party machines or equipment, in the out-of-home channels one has to think of selling or renting co-branded machines to the outlets, along with the replenishment of coffee and other drinks and beverages (market share 45%).

Global coffee consumption averages 4 kilograms per year per capita; in the Netherlands this is about 8.4 kilograms per year per capita. This consumption has been stable for many years, showing only slight increase. Typical of the CBR market is that the coffee brand has not been relevant for quite some years, except for some nations, like the Netherlands and Spain, where branded outlets are on the rise. Branded outlets aim to create experience for consumers through chain branding and single space branding. The proprietors want to make their place special, distinctive, similar to a brand. They can do this in different ways and on different levels. They have their own look and feel, from the name of their place and the furniture down to the cups they use. If they use branded coffee, like their alcoholic drinks, they will use the A-brands to attract consumers.

As for consumers, in the Netherlands the non-alcoholic beverage consumption consists of hot coffee (15%, of which more than 50% is regular coffee), cold coffee (1%), tea (4%). In Spain the consumption of coffee is about 4 kg/year x capita, of which 82% with milk, 80% with sugar, and 61 % of the total consumption takes place at breakfast.

Available market research at that time (Allegra and Datamonitor) signalled some European trends, like convenience, customisation, health, enjoyment, good behaviour, and freshness and authenticity in coffee. These reports also showed that mealtime dissolution is being exceeded by snacking growth; consumers are increasingly demanding 'positive nutrition' from food and drinks. Yet, consumers are unwilling to sacrifice sensory appeal for health. There is a growing willingness to try new flavor experiences; trying exotic flavours is typically an incremental process. Consumers are most likely to experiment in the afternoon, when the importance of boredom alleviation is most pertinent. Coffee and tea are personal consumption; circumstances of drinking may be social, but the drink is personal. People want it their way and are interested in trying new things. Even in a group they want it in their taste and form (the way it is served, etc.). They make it personal to be distinctive, authentic.

DE has a long and respected reputation of 250 years coffee production in the Netherlands, and is recognized for its many innovative products, services and processes. An example is the Senseo, a coffee machine developed with Philips, which was the first to make use of the nowadays renowned coffee pads. In spite of this reputation, DE has been experiencing an increasing competition in all fields, with major impact in the OOH channels. Because of this increasing competition Altuition was engaged in 2004 to support some business process improvement projects within the company, with focus on increasing sales, service and retention efforts to improve customer satisfaction. An aspect of all these projects was the reinforcement of the market or customer orientation of the company, by creating customer loyalty and customer experience, along with operational excellence in all customer interaction processes and where possible, mass customization. The projects were executed in 'waves' of 3 months each, followed by a period of a month rest, followed by new 'waves' of 3 months in order to avoid a too great project resource claim on the organization – in this respect the 'waves' show resemblance with process improvement projects in the Total Quality Management.

In May 2006 DE decided to execute a similar product/service development project as has been done in the preceding half year for the Out-Of-Home coffee Concepts in the medium business segment (Weber, 2009a), with support from Altuition. The intention was now to execute a similar project for the Café-Bar-Restaurants (CBR) segment. The reasons for doing a project for CBR is because it is a leading segment in OOH, trendsetting for other segments, but also a very competitive segment, emphasizing the need to innovate. CBR is very important in Netherlands, Spain, Czech Republic and Hungary. Executing the project creates opportunities for building and supporting brands. And finally, solutions are likely to be used in other horeca segments (Hotels & gaming, QSR & Coffee houses, Leisure, Convenience & retail). The project thus was an initiative of DECS International to manage a truly global OOH funnel which has buy-in of Key Opco's, because the global OOH funnel was managed in fragmented way and not full of breakthrough innovations. An important choice was to align key players in OOH in order to set direction, bundle resources and commit to best results, and to align the present methodology along with the application of best practices in the innovation process. The improvement of DE's innovation process started with Convenience & Retail in the US (FY05), followed by Medium Business in the Netherlands, Denmark and Belgium (FY06). As has been stated before, a focused 3 months approach per search area was followed, resulting in an idea and concept at the end of the 3 months. The project for the medium business segment in the Netherlands, Denmark and Belgium was executed in the period from December 2005 through March 2006, see Weber, 2009 (Weber, 2009a).

Similar to earlier projects, the Altuition concept development approach contained the following elements:

- a solid customer insights approach;

- an interactive process of idea generation (based on customer insights), selection and translation to concepts
- an approach with direct involvement of customers (co-creation) and designers
- a means to identify concepts at the product & service level
- a creative teaming component, and
- a tight project management schedule.

A mutual learning's from the previous project was that a less tight schedule for the strengthening and testing phase in the new planning and approach is requested, so this project took this into account.

The project which started in week 16, 2006, and ended in week 33, 2006, was executed by a project team consisting of Altuïtion and DECS team members, and consisted of the following activities:

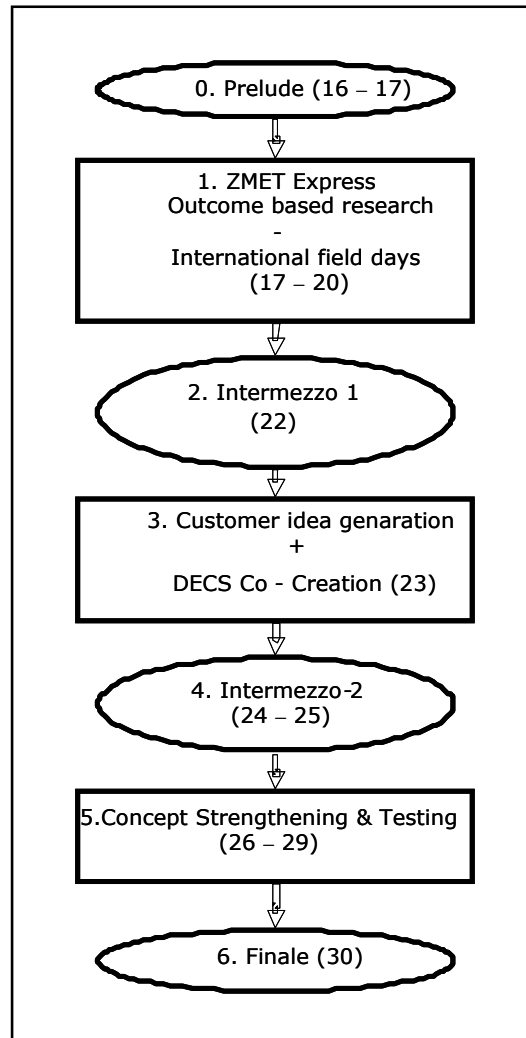
- A kick-off session with the team to set out ambitions and goals
- Development of an actual insight document based on DECS research documents and interviews with DECS sales
- Generation of 6-10 customer/consumer insights, (based on ZMET™ interviews in the Netherlands, Spain and the Czech Republic and outcome based focus groups (together with input from DECS Spain and the Czech Republic and input from Outcome Based Research conducted by Altuïtion with DECS customers)
- An insight sharing session where 3-5 insights will be chosen as input for co-creation.
- A co-creation process with customers, resulting in 5-8 concepts for the CBR segment.
- A concept strengthening and testing process (in the Netherlands) which, combined with input from Spain and the Czech Republic, will provide the project team with the information on favourable concepts.
- Three report-meetings to the advisory board (top management of DECS)

Altuïtion's contribution in specific skill sets and knowledge of the team consisted of project management, moderating team and customer sessions, market research, creativity and inspiration, with a back-up by its international UK/USA network of researchers and designers.

Project goal was to develop approximately 5 new concepts for the Cafés, Bars & Restaurants segment, based on solid consumer and customer insights (Outside-in), with a focus on a short cycle time by choosing only 3-5 insights for the idea generation stage. Further on, the project included customer co-creation, being applied in the idea generation together with customers, and concept strengthening and testing with customers. Sub goals were to obtain solid customer/consumer insights, to select high potential concepts for product development, to systematically convert all relevant customer insights into concepts, and to build on customer insights that can be developed into short term sales tools.

## Project plan and execution

The project was designed to consist of 6 phases, the first one being a preparation phase, and therefore referred to as Phase 0. Notice the use of the musical composition's metaphor in the naming of the phases (Figure 5-7). We will elaborate on all these phases.



**Figure 5-7: Project Plan for DECS Co-Created Concept Development (week numbers between brackets)**

### ***Phase 0: Preparations***

The first phase was aimed at immersing in the project subject, market and customer situation and needs through desk research of existing market research, conducting some interviews with relevant DECS sales and marketing managers in the concerned countries, and an international kick off meeting of DE and Altuition team members. The desk research and manager interviews resulted in a white paper focussing on the most important customer insights that could be extracted at that moment. The interviews with managers were conducted by Altuition consultants and were intended to get tacit knowledge about and of the customer to the surface as much as possible. The white paper acted as guideline on content issues in the further project steps and activities. In addition, preparations were done for the following phase by scoping the ZMET™ Express and Outcome Based Customer interviews in that phase, since the desk research resulted in

predominantly quantitative data. The preparation was done by determining the target customers, generating possible participants' lists, and creating the protocols for the two interview types.

### ***Phase 1: ZMET™ Express and Outcome based research***

The goal of this phase was to take inventory and systemize the overview of customer experiences, insights, and needs regarding the serving or consumption of coffee and tea in cafes, bars and restaurants in a qualitative sense. This inventory was taken by means of customer and consumer interviews, both individual (ZMET™ Express) and group interviews (outcome based focus groups). Since Altuition is an expert in these research methods, the interviews were prepared, conducted and analyzed by Altuition project team members.

For the ZMET™ interviews, a total of 6 participants in the Netherlands were recruited, 3 customers and 3 consumers. The customers were proprietors of a top end lunchroom, a grand café, and a top end restaurant; names and contact data were provided by DECS. The consumers, all younger than 35 years, were 2 inhabitants of the city 's-Hertogenbosch (1 male, 1 female), and 1 inhabitant of Amsterdam (female), who are frequent visitors of places where coffee is one of the primary offerings; they were recruited by a market research recruiting agency. The participants were first recruited by telephone asked if they were interested in participating in a 2 hours lasting face-to-face depth interview. When they agreed, an appointment was made, and they were sent a confirmation letter with instructions, consisting of the research question and the request to collect some images representing their thoughts and feelings about the question. The interviews were conducted in the cities where the participants resided, for which a meeting room was arranged. They were conducted from May 2 through 4. Interviews were also conducted in Spain (2 consumers and 1 customer) and the Czech Republic (2 consumers and 1 customer); in Spain in the Spanish language by an associated and licensed interviewer and in Czech in English by an Altuition-interviewer. All interviews were audio recorded and transcribed (and translated for Spain and Czech) for analysis.

The Outcome Based group interviews in the Netherlands consisted of interviewing 10 consumers, younger than 35 years, who are a frequent visitor of establishments where coffee and tea are served as a main consumption. The interviews were conducted in 2 sessions of 2.5 - 3 hrs each; one in Amsterdam (5 participants) and one in The Hague (5 participants). In the Czech Republic and Spain, the outcome based interviews were limited to 2 face-to-face interviews in each country. The applied method was the Outcome Based Research as adapted from Ulwick ((Ulwick, 2002)) and developed by Altuition, see Box 5-3. A script was made for the purpose of application in Czech Republic and Spain, since these interviews were conducted by local researchers.

A particular part of phase 1 consisted of field trips and visits to customer's sites in the involved countries. For example, one team member spent and worked 8 days in several hotels in the center of Amsterdam, thereby applying a type of ethnographic research, also known as empathic design. These field trips were documented in a written report, accompanied with pictures of the site, with customers in action, and preliminary ideas for new products and services.

Phase 1 resulted in 13 customer insights, 6 for customers, 7 for consumers.

### ***Phase 2: Intermezzo 1***

This step consisted of reporting of the ZMET™ and OBR interview results, the sharing and selection of insights for idea generation. This was done in a one day session on May 29, attended by Altuition and DECS, augmented with some marketing managers and customer experts. Another goal of this was to select 3-5 consumer/customer themes that

were eligible for co-creation. The activities consisted of a discussion on the research results (half day), the elimination of already sufficiently fulfilled or unimportant outcomes, the selection of 3-5 outcomes for the follow-up, and making appointments about the First Advisory Board, which was to take place before the next phase (June 1) and was intended to receive approval for the selected insights. The discussion was conducted via the research report of the ZMET™ and OBR. The selected insights for idea generation and co-creation were documented. Note that no customers or consumers were involved in this step. For the results of this step, see Box 5-4.

#### OUTCOME BASED RESEARCH

Outcome Base Research (OBR) is a research method in which we examine participants' desires and needs concerning specific products or services that lead to an improvement of the outcomes they aim for. People do not use products and services for their functional features, but strive to get a job done. This job is called an outcome. The outcomes people aspire can be of physical or psychological nature. For instance, someone mows the lawn, because it does not only maintain the grass quality, but also because it smells good and results in a fresh, sparkling view. The OBR is aimed at finding these outcomes and to discover which ones are not or insufficiently satisfied by the product or service that is being researched. It is a qualitative technique to elicit these outcomes. It is applied as personal or group interviews, in which creative techniques are used to avoid functional fixedness with respondents. It also makes use of apparent paradoxes in outcomes.

A general approach in the application is to start with an introduction that explains the purpose and program of the interview. After the introduction, participants are requested to take one or more recent experiences in using the product or service into their mind and to elaborate on the reasons for and context of doing this. Thus, insight is obtained in first order outcomes, usually functional outcomes. In a discussion the interviewer then tries to ladder up to higher order, more abstract outcomes, the psychological and social ones, and eventually in the values that respondents aspire. A next step would be to find obstacles and barriers that participants experience in satisfying these outcomes. In addition, work around or alternatives are also reviewed. By doing this, insight is obtained in the extent of outcome satisfaction and possible chances to improve the product or service features. An optional and final step would be to request the participants to think of non-existing alternatives in those cases where their outcomes are insufficiently satisfied. The interview is ended by thanking all participants for their contribution.

The interview can be supported by using mood boards on which participants can put post-its on which they write down their answers to the particular questions the interviewer asks. To elicit and articulate higher order outcomes or alternatives the interviewer can have participants use images or metaphors that represent what they feel or want to feel. To do this it is useful to have a couple of illustrated magazines, scissors, pins or glue, and such along as well.

A personal interview typically lasts one to one hour and a half; a group interview about three hours, depending on the amount of participants (usually 3 to 6). Participants receive an incentive for participating. (Adaptation by Altuition).

#### Box 5-3: Outcome Based Research (OBR)

##### Selected insights from ZMET™ and OBR

Five insights (3 customers, 2 consumers) were selected and appointed for the ideation stage. They are presented in this sub-sub-section the target group's perspective (in their wording).

##### **Customers:**

I want to sell coffee and tea to more consumers which visit my accommodation in the morning.

I want to increase my coffee and tea revenue by creating an experience around it, but the bottleneck is my personnel.

If guests could sense the product, it will have a positive effect on the amount I sell.

##### **Consumers:**

I am pleasantly surprised by receiving something I did not consciously aware of wanting and I appreciate it much.

I use my coffee and tea in cafes, restaurants and bars to actively contribute to my personal well-being and happiness.

#### Box 5-4: Selected customer insights for the project

### ***Phase 3: Co-creation***

This phase was aimed at an idea generation with customers, concept clustering, co-creation and visualization of new concepts with customers. The people who were involved were the Altuition team, the DECS Team, a designer (guest participant from the Altuition network), 4 key-DECS-customers (in financial sense, therefore not comparable with lead users), and an external creative facilitator. The activities consisted of a one-day idea generation session with the customers, and a one day idea clustering session with the core team (DECS and Altuition). This was followed by a 2-day creative session with 4-5 key customers during which a brainstorm and the selection of possible new concepts took place, based on the previous clustering by the core team. The sessions were conducted in the beginning of June and resulted in an overview of the innovation concepts thought up by DECS-customers.

The first ideation session proceeded as follows: the day started with a welcome and introduction by the facilitator. In this introduction the objectives and work method were explained. This was followed by some warming ups in creative thinking and reasoning (e.g. connecting the dots, how many dolphins do you see). Then the previously selected and approved insights were presented. The participants and team members were divided into 4 groups of about 4 persons each, and each team was requested to brainstorm for about 30 to 45 minutes per insight. After two rounds all team gathered together, presented their results to the others, where others had the possibility to augment the team ideas. At the end of the day the participating customers departed. The next day the core team gathered and repeated the previous day, only to now 'bucket' (sort) the ideas of the previous day. In this session ten buckets (categories that correspond with the insights) for all ideas were defined and 'filled', based on the preceding desk research, qualitative researches and ideation day. These buckets were used on the third and fourth day in which the ideas generated on the first day were bucketed (clustered to these categories). The ideation sessions were supported by GroupSystems, a computerized collaboration system for groups, containing several components, like brain storming, categorizing, voting, etc.

For every insight an ideation was conducted, aided by GroupSystems. It resulted in a grand total of more than 970 ideas, an average of about more than 190 ideas per insight. Following this ideation per insight, ideas were clustered by participants through the bucketing method. Ten buckets were 'filled' with the ideas; see Box 5-5 for a summary. A concept drawing expert attended the co-creation session. As part of the reporting a booklet was made for "Bright Ideas" in order not to lose them for the future.

### ***Phase 4: Intermezzo 2***

The goal of this phase was to work out of 5 – 8 concepts in concrete customer propositions which were to be presented to consumer panels and in customer interviews as part of the concept testing and strengthening. In this stage only Altuition and DECS were involved. The activities consisted of the design of a format for the customer propositions, the description of 5 –8 concepts – which resulted from the co-creation sessions – into customer propositions (see Figure 5-8), and making preparations for the strengthening en testing phase.

### **The ten buckets and corresponding idea sets**

#### **1. Convenient coffee and coffee related machines**

Insight: I want to increase my coffee and tea revenue; bottleneck personnel (customers)

Ideas to think about: coffee machine that can make a latte art; closed PdO grinder (with tins) that grinds per cup perfect quantity and right tamping pressure. The convenient machines should ensure the entrepreneur that they get a perfect coffee from DECS the coffee authority

#### **2. Fresh coffee experience enrichers**

Insight: I am pleasantly surprised (consumer)

Ideas to think about are condiments that really enhance the experience; from the moment of order (or even before) until you leave the establishment, like bakery smell, branding, surprises, and such.

#### **3. Health beverage system**

Insight: I want my beverages (coffee & tea) to actively contribute to my personal well-being (consumer)

Ideas to think about: a multi beverage system with hot & cold beverages with additives and/or vitamins.

#### **4. The sell and serve customer training**

Insight: I want to drive my business (customers) + I am pleasantly surprised (consumers)

Ideas to think about: sales training to waiters and barista training to people behind bar, coffee university with diploma for attendants; barista service in big cities (rent a barista), etc; Mystery guest who is giving you advice to attract more people.

#### **5. Customize and personalize your coffee & tea drink**

Insight: : I want to drive my business (customers) + I am pleasantly surprised (consumers)

#### **6. The (multimedia) order your drink device**

Insight: Creating experience + bottleneck (customers) and also sensing(seeing) is buying

#### **7. The coffee smell experience: the ultimate coffee roaster and grinder**

Insight: sensing is buying + over the threshold

#### **8. The total tea experience concept**

Insight: I want to be pleasantly surprised

Ideas to think about: loose tea concepts with fresh fruits, herbs or even vitamins; high tea concept, etc.

#### **9. The “what type of milk do you want”- machine**

Insight: health

Ideas to think about: milk variety machine with different types of milks (indulging with flavors), low fat, soy milk, etc

#### **10. Coffee: @ anytime, 4 anyone and any season**

Insight: health, coffee experience

Ideas to think about: coffee at different times of the day. Or different times of the year. Per season? Or coffee for different people; without the negative element; for the growing elderly population. Use your imagination ..... Ready to drink? Beans?

### **Box 5-5: Summary of the 10 buckets**

#### ***Phase 5: Concept Strengthening and Testing***

This phase consisted of the further development, strengthening and testing of the 5 to 8 concepts with DECS customers (international) in the cafe, bar and restaurant segment. It was conducted with both DECS-customers (businesses) and consumers (end users). The activities consisted of the recruiting of customers, execution of the interviews for proposition strengthening with DECS-customers, the execution of concept strengthening sessions with consumers, the adaptation of the customer propositions based on these sessions, and the processing of the results. The activities were conducted in weeks 26 to 29 and resulted in validated and tested customer propositions for the concepts.



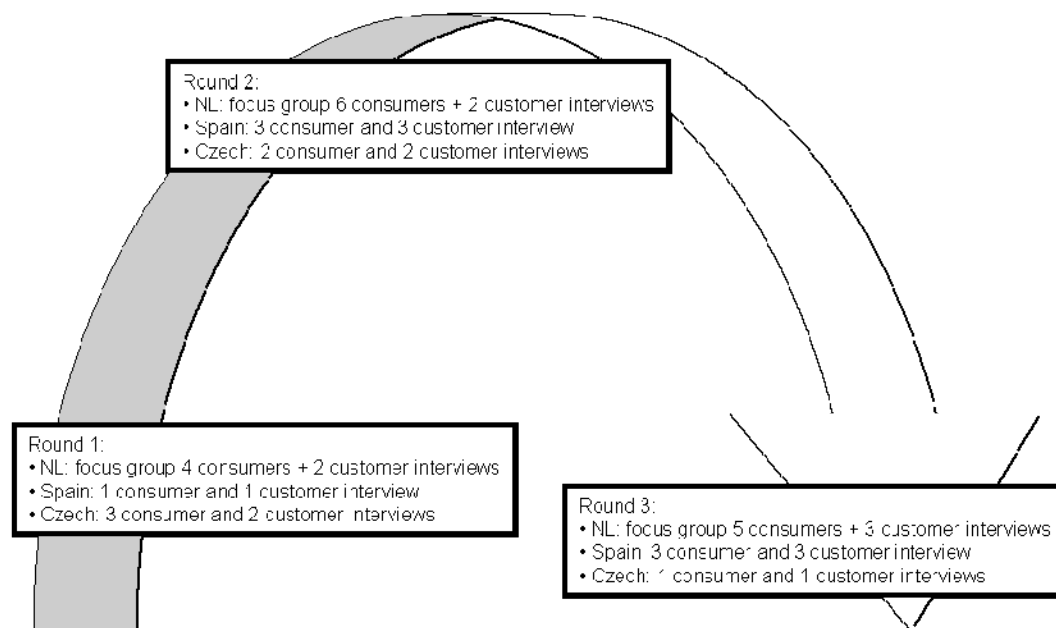
	Over the threshold	Pleasantly surprised	Well being & happiness	Experience around coffee and tea	Sensing is buying
Customize your coffee kit	★			★	
DE Surprise menu		★		★	
Milk variety machine			★		
Multi media ordering device					★
Loose tea with tea egg		★		★	
Around the clock beverage system			★		
Variety grinder & tamper				★	
Latte art machine				★	

**Figure 5-8: Overview of relation between concepts and insights**

In the Medium Business Customer Insight based Concept Development (Weber, 2009a) the phase 5 activities were initially intended for execution with only the business customers. However, the insights have demonstrated that offerings in the Cafes, Bars and Restaurants segment are important for consumers as well. Therefore focus groups for consumers have been included in the work plan. The respondents in Phase 5 consisted of men and women, age ranging from 25-35 years. Customers were waiters, owners or managers of bars, cafeterias and restaurants. Consumers were people who go at least 5 times per week to drink or eat out of home whereas they all drink and like coffee. In the Netherlands 3 customers were interviewed, recruitment was done by Altuïtion based upon customer list prepared by DECS. The consumer sessions consisted of 2 focus groups, 5 consumers per group, recruitment was outsourced by Altuïtion. The interviews and group session were scheduled in 2 consecutive days. For Spain and the Czech Republic, 3 – 4 customers were interviewed (recruitment arranged by DECS), and 2 focus groups, each 4 – 5 consumers were conducted (recruitment arranged by DECS). Customer interviews and consumer group sessions were executed in 2 consecutive days in order to save on travelling time and costs for the facilitators. Participating customers were requested to sign a non disclosure agreement to prevent leakage about the concepts towards competitors.

The objective of this research was to define the acceptance of those concepts by both customers and consumers. More in depth, for each concept the following aspects were explored: (1) general interest and engagement of respondents with the proposal; (2) fit with customers and clients needs; (3) novelty and differentiation; (4) key elements of the idea; (5) main likes and dislikes; (6) key benefits of the concept for customers and consumers; (7) issues regarding the feasibility and convenience of the concept; (8) reactions towards the price and willingness to buy; (9) projected moments of use and consumer profile; (10) brand image; and (11) optimizations for the concepts. The method used (see Figure 5-9): the whole concept test research was conducted in three rounds, with about one week interval, each round followed with an adaptation of the concept, based on the findings of that round. Dependent on the country and target group in depth interviews lasting 1.5 hours (Spain and Czech, in NL for customers) or focus

groups of 3 hours (in NL for consumers) were conducted. The execution of Strengthening & Testing Focus group sessions was video recorded. For results, see Box 5-6.



**Figure 5-9: Concept testing and strengthening procedure**

#### Results per concept in all countries

**Concept 1:** The “indulge yourself” – coffee kit. Insights: Over the threshold; Experience around coffee & tea. Features: Consumer makes own specialty at table from recipe; only sweet ingredients – indulging. Rated high in Czech and Spain; relatively low in Netherlands.

**Concept 2:** Grand Coffee. Insight: Experience around the coffee & tea. Features: New approach; consumer gets coffee experience; but at premium price. Difficult to implement for DECS; Quality of non-coffee related items. Scored high in NL (consumers) and low in Spain and Czech. Appreciated more by consumers than customers.

**Concept 3:** The “special healthy milk” machine. Insight: Well-being & happiness. Features: Consumer can choose healthier milk variants, for customer very convenient milk system: Variety, Hardly any hassle, No waste; Concept changed from milk variety to healthy milk. Consumers and customers do however relate it to healthy concept (and not healthy milk only). Scored with consumers in all countries within top 3.

**Concept 4:** 4. Experiencing the “Pickwick tea egg”. Insight: Experience around coffee of tea. Features: Premium tea concept for consumer with loose tea (quality!); Concept strengthened in all phases: Cup vs. pot, real loose vs. pouches, Automatic device vs. traditional egg. Promising concept; but more work to be done. Scores medium to high in all countries, by both consumers and customers.

**Concept 5:** A coffee 4 every moment. Insight: Well-being & happiness. Findings: Transformed from health to mood concept (well-being); More work to be done: Lot of question marks, perceived as a ‘marketing’ concept, for other segments than ReCaBa. Not a clear winner.

**Concept 6:** The variety grinder & tamper. Insight: Experience around the coffee & tea. Features: New variety grinder & tamper: 4 different blends, Tins to throw away, Grinder + tamper in 1 machine. Winner in all countries with customers. Not tested with consumers.

#### Box 5-6: Results of concept strengthening and testing

##### Phase 6: Finale

The goals of this phase were to elaborate on the most potential concepts into detailed concept descriptions, and to select the ‘winning’ concepts. Therefore the concepts were prepared for judgment and selection by the Advisory Board. It was done by the DECS Core Team and Altuition in a session of approximately half a day to discuss and finalize the obtained customer propositions. The concept descriptions consisted of a high level proposition with visualizations, animations, storytelling, and a product biography, and

“reasons to believe” depicting why the proposition convinces. The preparations were made on July 24 and Advisory Board on July 25, 2006. See Box 5-7.

Conclusions & recommendations of the Advisory Board
<b>To work out in a next phase:</b> Variation grinder & tamper (very positive in all countries); Tea egg (customers and consumers positive, make for cup and pot); Customize your coffee kit (consumers are positive, bottlenecks customers to overcome); Milk variety (high score, but also a lot of negative remarks).
<b>Question mark:</b> Coffee 4 every moment (work out for other segments).
<b>Not to be worked out any further:</b> Grand coffee (Different ideas. Scoring not clear. Difficult for DECS to implement); Latte art machine (Customers have no believe in this concept).

**Box 5-7: Conclusions and recommendations at the end**

### **5.3.3 Key learning points**

#### **Context of involvement**

##### ***Type of firm(s) and industry, economic and technological environment***

DE is a large, global operating manufacturer of fast moving consumer goods. Although coffee and tea can be perceived as commodities, it is clear from the case that offerings by DE can be categorized as services and experiences around these commodity products that are not technologically complex. The company also distinguishes a diverse variety of customers: from outlets to consumers, thereby creating a very heterogeneous proposition in its markets. Everyone uses coffee or tea, but the consumption is personal, not merely because of differing taste, but mostly because of the personal experience. For some drinking is a social activity and has, inherently, a social meaning, while others seek novel drinks, and so on. It may be obvious that, because of this heterogeneity and individual needs and wants, that customer involvement is a very practical step in developing innovations.

It was also observed that customer involvement in this project was an aspect of the increased market orientation, in particular the customer orientation strategy of the company, where it was the intention to develop innovations based on customers’ needs and wants in the market and to increase the value for the customers. Customer orientation seems to be an important premise for customer co-creation in innovations.

##### ***Source of the innovation***

The innovation project was initiated by DE and the focus on a particular market was also determined in advance. However, the customers’ needs and wants for which to develop the innovation was left open. There was an ideation session with (business) customers (not consumers) which led to a numerous of ideas generated by the market. And although the clustering (bucketing) was conducted by the project team without the involvement of these customers, the selection of the most promising ideas was done by the customers as well. Therefore, we can perceive the customer as the real source of this innovation.

##### ***Type of innovation***

Although the project was intended to innovate in the innovation processes – i.e. an organizational or management innovation – the choice was made to proof case it by innovating in the BaReCa market in different countries with customer involvement. DE wanted to use the innovation funnel approach (i.e. the stage-gate approach), by generating some 5 to 8 viable concepts for the implementation stage of the innovation process. The concepts were required to be of a breakthrough (radical or really novel) category. As can be observed from the Advisory Board decisions and customers’

reactions, several concepts can be indeed regarded as really novel, although 'ordinary' customers and consumers were involved.

Because of high competition in the market, DE had the intention to not fully disclose its purposes and ideas to the market, so necessary precautions were taken to prevent premature disclosure of ideas for new products and services, including measures towards participating customers in the idea generation and concept strengthening activities. In this way involvement can be regarded as a closed mode innovation.

## **Customers which are involved**

### ***Customers' expertise and competences***

A first observation concerns the type of customers that were involved. Both business customers and consumers were involved in this project, whereas focus was – initially – on the business customer. Although consumers can be regarded as the 'real' end users of coffee and tea, we cannot go beyond the fact that business can also be regarded as 'end users' in the sense that they use the replenishing and marketing services provided by DE. The differences in end use can be observed from the difference in needs and wants, but also in that different concepts that emerged during the project.

As can also be observed from the case description, no particular expert requirements were stated for participation by customers or consumers, aside from some demographic requirements (age, residence) and use expertise. Consumers, in particular, were required to be intense users of coffee and tea in out of home outlets – during the concept testing – because it was assumed that only users are able to judge and value the concepts properly. Similarly, key business customers were invited for these activities. Key customers are regarded as important 'users' of DE-products and services in financial and market share sense, not because they are 'lead users'. Although these properties may coincide, participation was not based on the criterion of being product and market knowledgeable. In a way, all participants can be regarded as 'ordinary' customers.

Finally, it can also be observed that participants were changed in each step. None of the participants, neither customers nor consumers, was involved in more than one activity. The amount of participants varied with the activity which was performed, from one (in the personal interviews) to five (in the group sessions), with a grand total of 62 (39 consumers and 33 business customers) different participants in three countries were involved.

### ***Engaging the customer***

Participants were all asked during the session or interview why they participated. Participants were intrinsically motivated to participate; positive project results would lead to sales improvement and customer satisfaction for the business customers, while consumers would get the wanted the experience in consuming coffee or tea. Also, mere participation made participants feel respected and acknowledged by DE, because they were not used to receiving this kind of attention from DE before. Therefore, no reward promises had to be made to engage participants. But, nevertheless, all participants received a company gift after participation.

## **Process of involvement**

### ***Timing of the involvement, roles and contributions of participants***

Customer involvement was clearly aimed at obtaining customer input in the front end of the innovation stage, the conception stage. The reason for this involvement was to develop concepts which were based on customers' needs and wants. Although the focus on specific themes was created by the project team through customer insights, needs

and wants were stated by involving participants through personal and group interviews. Proceeding, the idea generation and screening was also done by involving participants. And later on, customers judged the generated concepts and provided ideas to improve them. Participants thus contributed in 3 roles, i.e. as a resource (needs and wants), conceptualizer (generating ideas) and tester (judging concepts).

### ***Interaction/communication mode and intensity***

All activities where customers were involved were conducted in physical encounters, in which face-to-face interaction prevailed above technology aided communication. And as can be observed from the amount of different participants, personal interviews and the lasting of these interviews and group sessions one can be assured that interaction was really intense. In these activities, physical settings are important to facilitate real time interaction, where non-verbal communication also is a part of the communication process. This made interaction intense and in depth instead of shallow, in order to reach the emotional level of participants. In one particular stage (phase 3, co-creation) participants even became project team members where interaction was on an equal base in order to promote authenticity and avoid social desirable behavior.

### ***Techniques and tools to support CI***

The funnel approach which DE used is similar to the stage-gate approach as propagated by innovation experts and scholars (see Section 2.7). In this approach stage specific tools, methods and techniques should be used. DE made use of its own toolbox, but because it did not have any real experience with customer participation, the company needed to adopt some additional methods, specifically intended to support this participation. Altuition brought these methods in, i.e. the ZMET™ to elicit latent needs and wants and the outcome based method to develop customer insights and requirements. Other techniques were common innovation tools (brainstorming, concept testing and such). Where appropriate, participating customers were introduced and trained in the technique, e.g. ideation in the co-creation stage.

### **Project specific issues**

Marketing of the innovation process itself: thought has been to use the DECS powered up innovation as a marketing asset. Special attention was given to the internal promotion of the project to create awareness with DE employees. But, because of the outcomes, the project also illustrated the potential of customer co-creation in innovations as an aspect of customer orientation.

Language barriers because of the different countries formed a risk. A proposed solution was to use English as a project language. Interviews with DECS employees were conducted in either Dutch or English. Other interviews, e.g. with customers or consumers was done in the local language or in English with an interpreter. All interviews were however recorded and transcribed. All transcripts were then translated in English, so analysis and reporting were not obstructed by these barriers.

## **5.4 Procter and Gamble's Connect + Develop**

### ***5.4.1 Introduction and background***

"We've collaborated with outside partners for generations - but the importance of these alliances to P&G has never been greater. Our vision is simple. We want P&G to be known as the company that collaborates - inside and out - better than any other company in the world. I want us to be the absolute best at spotting, developing and leveraging relationships with best-in-class partners in every part of our business. In fact, I want P&G to be a magnet for the best-in-class. The company you most want to work with because you know a partnership

with P&G will be more rewarding than any other option available to you.” (A.G. Lafley Chairman of the Board, President and Chief Executive of the Procter & Gamble Company on P&G website)

For decades, Procter & Gamble fuelled its consumer products engine from R&D inside its own walls. But as its markets have matured, P&G has directed its search outward. The following case description is an excerpt based on the website content ([www.pgconnectdevelop.com](http://www.pgconnectdevelop.com)), an article in Harvard Business Review (Huston & Sakkab, 2006), an interview with Jeff LeRoy about P&G's Connect + Develop ([http://www.pg.com/company/connect\\_develop.shtml](http://www.pg.com/company/connect_develop.shtml)), a presentation by P&G's Associate Director in Switzerland, James Joia on March 5, 2009 in the Netherlands (Joia, 2009), and several other news articles.

### **5.4.2 Case description**

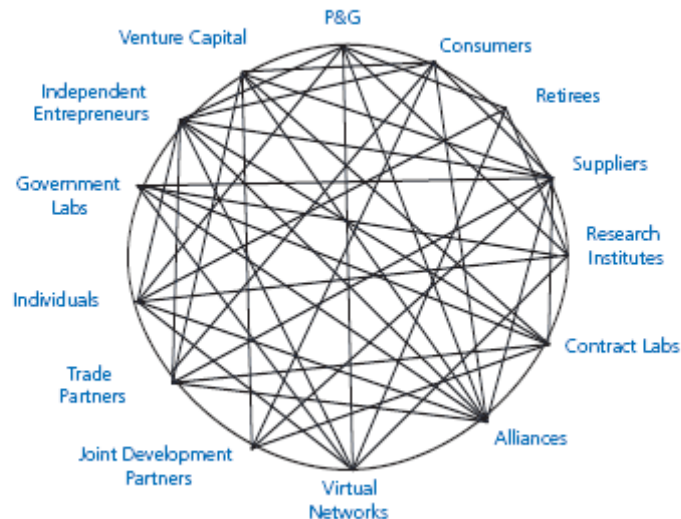
Procter & Gamble is a global provider of consumer products in diverse categories, including personal hygiene, household, health care, paper products, snacks, beverages, cosmetics, fragrances, and fabric and clothing care products, with nearly 300 brands in more than 160 countries. It produces on a global scale, reaching \$51 billion in sales. From its beginnings in 1837 as a soap and candle company to its current position as a global consumer products leader, Procter & Gamble has embraced the innovative principles of research and development. P&G brands have been, and continue to be, developed to provide consumer value based on the application of science. While today's consumer market is global in reach, it remains driven by the cultural preferences and demands of communities from Latin America to Africa to Southeast Asia and beyond, with about five billion consumers in total ([www.pgconnectdevelop.com](http://www.pgconnectdevelop.com)).

### **P&G's Connect + Develop Approach**

Procter & Gamble has operated one of the greatest research and development operations in corporate history. But as the company grew to a \$70 billion enterprise, the global innovation model it devised in the 1980s was not up to the task. CEO A. G. Lafley decided to broaden the horizon by looking at external sources for innovation. P&G's new strategy connect and develop, uses technology and networks to seek out new ideas for future products. Betting that these connections were the key to future growth, Lafley made it P&G's goal to acquire 50 percent of its innovations outside the company. The strategy wasn't to replace the capabilities of our 7,500 researchers and support staff, but to better leverage them. As P&G studied outside sources of innovation, it estimated that for every P&G researcher there were 200 scientists or engineers elsewhere in the world who were just as good—a total of perhaps 1.5 million people whose talents it could potentially use. But tapping into the creative thinking of inventors and others on the outside would require massive operational changes. The company needed to move the company's attitude from resistance to innovations "not invented here" to enthusiasm for those "proudly found elsewhere." And it needed to change how it defined, and perceived, its R&D organization—from 7,500 people inside to 7,500 plus 1.5 million outside, with a permeable boundary between them. In addition, the Internet had opened up access to talent markets throughout the world. And a few forward-looking companies like IBM and Eli Lilly were beginning to experiment with the new concept of open innovation, leveraging one another's (even competitors') innovation assets—products, intellectual property, and people (Huston & Sakkab, 2006:3).

P&G has a history of acquiring technologies from outside the company. What is particularly new in its Connect + Develop approach to external relationships is its strong focus on *ready-to-go* innovations. It is particularly interested in solutions that have already been reduced to practice in some part of the world, and in disruptive ideas for its business categories. Through its C+D relationships (see Figure 5-10), it continually

searches for products, packaging, technologies and commercial opportunities that can be reapplied, to P&G's brands and rapidly introduced to better serve consumers.



**Figure 5-10: P&G's network for collaboration**

### **Making the Connection**

Procter & Gamble is actively seeking opportunities to connect with innovators from around the world. P&G wants to connect with anyone who has the next game-changing products, packaging, technologies, processes and commercial connections to help improve the lives of the world's consumers. Potential innovators are addressed in the following manner: "First... Determine if your product, packaging, technology, process or commercial connection is in the interest of P&G and our global consumers, by checking the requirements

- The innovation addresses a big, unmet consumer need.
- The innovation offers a new benefit to an existing P&G category or brand.
- The packaging solution has been demonstrated.
- The technology is proven and can be quickly applied to a P&G consumer need.
- The product is in use and has evidence of consumer interest."

If one of these requirements is met, submitters have a 'game-changing technology or approach'. They can then log on to one of the eR&D network web connections to review existing P&G research opportunities, preventing them from submitting ideas that are already in process. They can follow up with their P&G contact.

Procter & Gamble's Connect + Develop uses online R&D marketplaces and other intermediaries, like [www.InnoCentive.com](http://www.InnoCentive.com), [www.NineSigma.com](http://www.NineSigma.com), and [www.Yet2.com](http://www.Yet2.com) to identify and acquire ideas and technologies from independent inventors (Nambisan & Sawhney, 2007). NineSigma, Inc. is a Cleveland-based leading innovation sourcing firm that delivers connections to sources all over the world to meet its clients' most challenging needs through its proprietary Internet-based managed exchange process. Like in the technology-brokering process model of Hargadon and Sutton (Hargadon &

Sutton, 1997), this NineSigma marketplace provides Procter&Gamble exposure to technological solutions in one area that are potentially valuable yet previously unseen in others. The bidding process in this innovation market example requires some specific features from information systems. The information system is based on RFPs (requests for proposals) that are submitted by companies as web forms to NineSigma Database. The researchers, other companies and innovators are supposed to reply to these RFPs with their proposals. The system sends a weekly e-mail with current RFPs. This e-mail newsletter contains links to NineSigma database with related RFP-descriptions. Researchers and innovators are able to provide their short research / invention description, but are not able to modify or access it afterwards. In overall, the customization of the service and the online community features are missing from the system (Mäkipää et al., 2006).

Consumers or any other individual can also submit ideas through the Connect + Develop website (see Figure 5-11). These ideas can contain an answer to specific innovation needs that P&G periodically publishes (Figure 5-12), but can also contain any other idea, which the submitter considers innovative for P&G. For connect and develop to work, it realized, it was crucial to know exactly what it was looking for, or where to play. If it had set out without carefully defined targets, it would have found loads of ideas but perhaps none that were useful to P&G. So it established from the start that it would seek ideas that had some degree of success already; P&G needed to see, at least, working products, prototypes, or technologies, and (for products) evidence of consumer interest. And it would focus on ideas and products that would benefit specifically from the application of P&G technology, marketing, distribution, or other capabilities (Huston & Sakkab, 2006).



**Figure 5-11: P&G Connect + Develop website ([www.pgconnectdevelop.com](http://www.pgconnectdevelop.com))**

When submitting the idea, submitters are immediately required to provide inherent IP-information, such as patent number, the originality of the idea, and such. P&G maintains the strategy that only ideas in which the submitter holds a patent or is the undisputable IP owner are eligible for submission and follow up, in order to avoid law suits or unintended patent breaches (Joia, 2009). If the idea is of interest to P&G, the submitter will be contacted starting negotiations on further development of the idea in new business, new product or new marketing. And if P&G thinks the idea, product, intellectual property, isn't necessarily a good fit for the firm, but it is for somebody else who it has a



relationship with, P&G will forward the submitter on to those people, even if it's another company or a competitor, because it wants to be known as the partner of choice, and it wants anyone to call back a next time. Jeff LeRoy:

"The first thing I'd say is that you can't own an idea. There's no basis for a transaction. So what we're looking for in Connect + Develop are people who have intellectual property — they have a patent, they have something that they actually own, they have a business so we can do a transaction." ([http://www.pg.com/company/connect\\_develop.shtml](http://www.pg.com/company/connect_develop.shtml))

Need Detail

Title	Hair Color Device - Software and Servicing
Types	Cooked Prod, Technology
Categories	Hair Colorants, Hair Products
Description	Innovative device/system with attractive design elements for professional hairdressers that measures hair color. See attached for additional description/requirements.
File	<a href="#">Hair Color Device Software and Service pgcd.com.doc</a>
Created	Dec 18, 2009

[Submit your Innovation for this Need](#)

[Back to Needs](#)

**Figure 5-12: Example of a P&G innovation need ([www.pgconnectdevelop.com](http://www.pgconnectdevelop.com))**

For P&G R&D to use connect and develop Huston and Sakkab suggest (Huston & Sakkab, 2006):

- Know where to look. Before sourcing the world for ideas you might develop into profitable products, clarify what you're looking for:
  - Identify consumer needs. Ask business unit leaders which consumer needs, when satisfied, will drive their brands' growth. Translate needs into briefs describing problems to solve. Consider where you might seek solutions. Example: P&G unit managers identified a need for laundry detergent that cleans effectively in cold water. They decided to search for relevant innovations in chemistry and biotechnology solutions that enable products to work well at low temperatures. Possibilities included labs studying enzymatic reactions in microbes that thrive under polar caps.
  - Identify adjacencies. Ask which new product categories, related to your current categories, can enhance your existing brand equity. Then seek innovative ideas in those categories. Example: P&G expanded its Crest brand beyond toothpaste to include whitening strips, power toothbrushes, and flosses.
- Leverage your networks. Cultivate both proprietary and open networks whose members may have promising ideas. Example: P&G's proprietary networks include its top 15 suppliers, who collectively have 50,000 R&D staff. It created a secure IT platform to share problem briefs with these suppliers—who can't see others' responses to briefs. One chemical supplier, for example, may have ideas for making detergent perfume last longer after clothes finish drying. P&G's open networks include NineSigma, a company that connects interested corporations with universities, government and private labs, and consultants that can develop solutions to science

and technology problems. NineSigma creates briefs describing contracting companies' problems and sends them to thousands of possible solution providers worldwide.

- Distribute and screen ideas. You've identified ideas for refining and further commercializing existing products or for employing technology solutions to create new products. Now distribute these ideas internally—ensuring that managers screen them for potential. Example: At P&G, product ideas are logged on P&G's online "eureka catalog," through a template documenting pertinent facts—such as current sales of existing products or patent availability for a new technology. The document goes to P&G general managers, brand managers, and R&D teams worldwide. Product ideas are also promoted to relevant business line managers, who gauge their business potential and identify possible obstacles to development.
- Promote openness to external ideas. Encourage use of outside ideas. For example, P&G rewards employees for speed of product development. Incentives thus favor innovation developed from outside ideas, since these often move more quickly from concept to marketplace.

#### Connect + Develop Successes

Consumers around the world have already realized the benefits of P&G's Connect + Develop strategy. The following products and technologies are examples of the mutually beneficial collaborations we have established through external connections.

Procter & Gamble used connect and develop to launch Pringles Prints—a line of potato crisps printed with entertaining pictures and words—in record time and at a fraction of the normal cost. Instead of looking inside for solutions to the problem of how to print images on crisps, P&G searched its global networks of individuals and institutions. It discovered a small bakery in Italy, run by a university professor who had invented an ink-jet method for printing edible images on cakes and cookies. P&G adapted the method—and its North American Pringles business scored double-digit growth (Huston & Sakkab, 2006).

*Ready-To-Go Technologies:* P&G introduced Bounce, the world's first dryer-added softener, after acquiring the product technology from the independent inventor who developed the innovative fabric-care solution. This connection allowed the inventor to leverage P&G's scale in the Fabric Care Market.

*Ready-To-Go Products:* By acquiring the newly introduced SpinBrush, P&G was able to bring a superior oral care brand to market quickly, without undertaking the time and expense of developing an entirely new product. This allowed the inventor to benefit from connecting their product to an existing market leading brand.

*Ready-To-Go Packaging:* Several of the Olay Skin Care products now utilize new consumer-preferred pump dispensers originally developed by a European packaging products company. P&G led a collaborative improvement process to make the original pumps more effective prior to their launch in Olay's North American markets. This connection allowed them to realize a greater return by leveraging the volume of an established global brand.

*Commercial Partnerships:* P&G found the perfect complement to the Swiffer brand in a hand-held duster developed by a Japanese competitor. After purchasing the product, P&G leveraged elements of existing manufacturing processes and advertising components to launch Swiffer Duster within 18 months. This connection allowed them to leverage markets where they previously had no presence, and create an on-going win-win partnership with P&G.

Aside from these new products and new businesses P&G also engages hundred of thousands mothers as product advocates in its marketing and sales activities – either salient or secretly, through buzzing (Libert & Spector, 2008; Smit, 2006).

#### Box 5-8: Some examples of P&G's C+D successes

### Results

The model seems to work. At the end of 2006, more than 35 percent of P&G's new products in market have elements that originated from outside P&G, up from about 15 percent in 2000. And 45 percent of the initiatives in its product development portfolio have key elements that were discovered externally. Through Connect and Develop—along with improvements in other aspects of innovation related to product cost, design, and marketing—the R&D productivity has increased by nearly 60 percent. The innovation success rate has more than doubled, while the cost of innovation has fallen. R&D

investment as a percentage of sales is down from 4.8 percent in 2000 to 3.4 percent in 2006, i.e. about 2.5 billion dollars. And, in 2005 and 2006, they have launched more than 100 new products for which some aspect of execution came from outside the company. Five years after the company's stock collapse in 2000, it has doubled its share price and has a portfolio of twenty-two billion-dollar brands (Huston & Sakkab, 2006). Some product examples are depicted in Box 5-8.

### **5.4.3 Key learning points**

#### **Context of the involvement**

##### ***Type of firm(s) and industry, economic and technological environment***

Procter & Gamble is a globally operating company for consumer products in diverse categories, making its product and service offerings very heterogeneous in heterogeneous markets. The firm has always tried to focus on delivering customer value based on the application of science. The company can be regarded as market oriented and probably very customer oriented, given its history in conducting needs assessment, but because of the type of products also relying heavily on scientific and technological knowledge.

##### ***Source and type of the innovations***

Procter & Gamble made it P&G's goal to acquire 50 percent of its innovations outside the company. P&G has a history of acquiring technologies from outside the company. What is particularly new in its Connect + Develop approach to external relationships is its strong focus on *ready-to-go* innovations. It is particularly interested in solutions that have already been reduced to practice in some part of the world, and in disruptive ideas for its business categories.

#### **Customers which are involved**

##### ***Customers' expertise and competences***

Procter & Gamble is actively seeking opportunities to connect with innovators from around the world. P&G wants to connect with anyone – consumers included – who has the next game-changing products, packaging, technologies, processes and commercial connections to help improve the lives of the world's consumers. In this case we see Procter & Gamble choosing the road of Open Innovation with all possible external parties, including consumers. The collaboration is not restricted to just one partner. The possible contributors exist of professionals (scientists, researches) and amateurs (customers, consumers). Even non customers or competitors are welcome. P&G does not discriminate in this respect and will even direct submitters to competitors if the company itself can not make use of the idea.

##### ***Engaging the customer***

It has been described how potential innovators are addressed to submit their ideas. Emphasis is put on the originality and authenticity of the idea, preventing them from submitting ideas that are already in process or under patent. It can also be observed that P&G has a preference for market –ready ideas and products instead of raw ideas, although these latter ones are not excluded. It is expected that typical scientists, inventors and such, will be the idea providers instead of ordinary consumers. The emphasis on demonstrating IP-ownership and taking over the IP from the submitter of the idea enforces this assumption that consumers will not feel eligible to submit an idea.

Problems (or challenges) are clearly defined by the company in the P&G Needs, ensuring that possible innovators understand what is requested and that no unuseful ideas are

submitted. This saves time and resources in the screening of the ideas (contrary to what we will see in the next case, IBM), but might inhibit the submission of breakthrough or radical ideas, which the company has not thought of in its opportunities search. Problems are typically R&D defined, scientific or technological challenges, to which the own R&D has not found an answer, yet.

Aside from an own website where submitters can directly contact P&G, it also relies heavily on external brokers that possess a large knowledge community. This saves time and effort to seek and find the right ideas.

Contributors are rewarded through a future partnership with P&G or by receiving a price for their idea. In the latter case the contributor sells his idea or patent to P&G, disclaiming all future benefits, such as royalties or sales profits.

## **Process of involvement**

### ***Timing of the involvement, roles and contributions of participants***

As previously observed, the P&G Connect + Develop approach is focused on *ready-to-go* innovations. It is particularly interested in solutions that have already been reduced to practice in some part of the world, and in disruptive ideas for its business categories. Consumers or any other individual can also submit ideas through the Connect + Develop website. These ideas can contain an answer to specific innovation needs that P&G periodically publishes, but can also contain any other idea, which the submitter considers innovative for P&G. For connect and develop to work, it realized, it was crucial to know exactly what it was looking for, or where to play. If it had set out without carefully defined targets, it would have found loads of ideas but perhaps none that were useful to P&G. So it established from the start that it would seek ideas that had some degree of success already; P&G needed to see, at least, working products, prototypes, or technologies, and (for products) evidence of consumer interest. And it would focus on ideas and products that would benefit specifically from the application of P&G technology, marketing, distribution, or other capabilities.

### ***Interaction/communication mode and intensity, tools and techniques***

Procter & Gamble's Connect + Develop uses online R&D marketplaces and other intermediaries to identify and acquire ideas and technologies from independent inventors. The bidding process in this innovation market example requires some specific features from information systems. The information system is based on RFPs (requests for proposals) that are submitted by companies as web forms. The researchers, other companies and innovators are supposed to reply to these RFPs with their proposals. The system sends a weekly e-mail with current RFPs. This e-mail newsletter contains links to NineSigma database with related RFP-descriptions. Researchers and innovators are able to provide their short research / invention description, but are not able to modify or access it afterwards. In overall, the customization of the service and the online community features are missing from the system.

When submitting the idea, submitters are immediately required to provide inherent IP-information, such as patent number, the originality of the idea, and such. P&G maintains the strategy that only ideas in which the submitter holds a patent or is the undisputable IP owner are eligible for submission and follow up, in order to avoid law suits or unintended patent breaches (Joia, 2009). If the idea is of interest to P&G, the submitter will be contacted starting negotiations on further development of the idea in new business, new product or new marketing. And if P&G thinks the idea, product, intellectual property, isn't necessarily a good fit for the firm, but it is for somebody else who it has a relationship with, P&G will forward the submitter on to those people, even if it's another

company or a competitor, because it wants to be known as the partner of choice, and it wants anyone to call back a next time.

### **Case specific issues**

P&G gives much attention to internal adaptation of this approach: employees have to learn how to avoid the NIH-attitude. Managing this change with the right incentives, rewards, and systems is one of the main issues in the C + D approach. Although this is an important aspect of using external input for the innovation it is something that we will hardly address in this research. We will give it some attention in our conclusions.

## **5.5 IBM's Innovation Jam**

### ***5.5.1 Introduction and background***

The following section is based on (1) an article by Bjelland and Wood (Bjelland & Wood, 2008) in MIT Sloan Management Review; (2) the company's website ([www.ibm.com](http://www.ibm.com)); (3) company's news releases from October 9, 2008 (source: <http://venturebeat.com/2008/10/09/ibms-innovation-jam-2008-shows-how-far-crowdsourcing-has-come/>); and (4) the IBM Innovation Jam 2008 Report (IBM, 2009).

Since 2001, IBM has used jams to involve its more than 300,000 employees around the world in far-reaching exploration and problem-solving. ValuesJam in 2003 gave IBM's workforce the opportunity to redefine the core IBM values for the first time in nearly 100 years. During IBM's 2006 Innovation Jam™ - the largest IBM online brainstorming session ever held - IBM brought together more than 150,000 people from 104 countries and 67 companies. As a result, 10 new IBM businesses were launched with seed investment totaling \$100 million.

IBM uses Jams to enable broad collaboration, gain new perspectives on problems and challenges, and find important patterns and themes—all with the goal of accelerating decision making and action. Jams are grounded in "crowdsourcing," also known as "wisdom of the crowds." (IBM, 2009).

Jams are not restricted to business. Their methods, tools and technology can also be applied to social issues. In 2005, over three days, the Government of Canada, UN-HABITAT and IBM hosted Habitat Jam. Tens of thousands of participants - from urban specialists, to government leaders, to residents from cities around the world - discussed issues of urban sustainability. Their ideas shaped the agenda for the UN World Urban Forum, held in June 2006. People from 158 countries registered for the jam and shared their ideas for action to improve the environment, health, safety and quality of life in the world's burgeoning cities (source: [www.collaborationjam.com](http://www.collaborationjam.com)).

### ***5.5.2 Case description***

#### **The 2006 Innovation Jam**

IBM did in 2006 an Innovation Jam, analogous to their Employee Jam of 2003: a massively parallel conference online. The innovation Jam took place in 2 3-day phases. It uncovered and solved problems in and mobilized support for substantial new ways of using IBM technology. It involved 150,000 IBM employees, family members, business partners, clients (from 67 companies) and university researchers. Participants jammed from 104 countries, and conversations continued 24 hrs a day. The first phase was in July, when the company posted information on key technologies and participants brainstormed new ways to use them. The second was in September, in which participants refined ideas from the first phase. In phase 2 participants were able to click to a separate

site where they could work on business plans for key issues using wikis. Many participants logged on just to look around. But participants posted more than 46,000 ideas. People could raise their idea freely, and the management of the Jam was based on the concept that "every idea counts".

But the Jam also shared many difficulties common to large brainstorming sessions. Naturally the brainstorming approach produced many ideas that were completely impractical or irrelevant to IBM's businesses. Monitors found that guiding the conversations was even more difficult than in traditional brainstorming sessions. Many of the skills the moderator needs in face-to-face weren't applicable: body language for instance. And when you go to sleep and come back after 8 hrs you have trouble knowing where ideas came from.

These problems were particularly notable in phase 2, devoted to refining ideas from the 1<sup>st</sup> phase. Group of managers had carefully sifted through the posts from phase 1 and came up with 31 "big ideas". The phase 2 participants were asked to indicate which ideas they thought were best and to propose and discuss refinements. Yet even with wikis provided for work on rough-draft business plans, it was rare to find suggestions that built on previously posted ideas. On the other hand, executives found that none of the major ideas from the Jam were completely original. People who had really important ideas had already spoken of them to some IBM managers. Ideas didn't bubble up and get refined through continual, respectful dialogue. In fact, few contributors built constructively on each other's posting. The Innovation Jam was organized to capture a huge number of ideas from IBM's network, and it was purposely designed not to guide conversation artificially toward a quick focus on a few thoughts. But without organizers pushing toward an artificial consensus, conversations did not move toward consensus by themselves.

Rather than emerging during online conversations, new visions emerged afterward. Senior executives spent weeks of sifting through all the postings after each phase, to harvest ideas, extract ideas they thought were key, put them together into coherent business concepts and link them with people who could make them work. Analysts and managers near the top were essential, together with sophisticated software for combing through vast amount of verbiage. Leaders found themselves identifying and nurturing a good idea as it was built on by the organization.

On November 14, 2006, IBM Chairman and Chief Executive Officer Samuel J. Palmisano announced that the company will invest \$100 million over the next two years to pursue ten new businesses generated by the Innovation Jam 2006. "Collaborative innovation models require you to trust the creativity and intelligence of your employees, your clients and other members of your innovation network," said Palmisano. "We opened up our labs, said to the world, 'Here are our crown jewels, have a look at them'. The Jam -- and programs like it -- is greatly accelerating our ability to innovate in meaningful ways for business and society." (<http://www-03.ibm.com/press/us/en/pressrelease/20605.wss>)

Palmisano revealed a portfolio of near-, mid- and long-term initiatives that will require new models of development and co-creation to bring to market.

- Smart Healthcare Payment Systems: Overhauling healthcare payment and management systems through the use of small personal devices (such as smart cards) that will automatically trigger financial transactions, the processing of insurance claims and the updating of electronic health records.
- Simplified Business Engines: Developing and bringing to market an intuitive, easy-to-use and pre-packaged set of Web 2.0 services and blade server offerings that allow small and mid-size businesses to easily tap applications customized to their own specific business needs.

- **Real-time Translation Services:** Offering advanced, real-time translation capabilities across major languages as a service for high-potential applications, industries and environments, such as healthcare, government and travel and transportation.
- **Intelligent Utility Networks:** Increasing the reliability and manageability of the world's power grids by building in "intelligence" in the form of real-time monitoring, control, analysis, simulation and optimization.
- **3D Internet:** Partnering with others to take the best of virtual worlds and gaming environments to build a seamless, standards-based 3D Internet -- the next platform for global commerce and day-to-day business operations.
- **"Digital Me":** Creating a secure, user-friendly service that simplifies storage, management and long-term access to the deluge of personal content that people accumulate (digital photos, videos, music, health and financial records, personal identification documents, files, etc.).
- **Branchless Banking for the Masses:** Enabling existing and new financial institutions to profitably provide basic banking services (checking, savings, payments, micro lending) to often remote, inaccessible populations in fast-growing emerging markets.
- **Integrated Mass Transit Information System:** Establishing on demand systems for integrating, managing and disseminating real-time data for all of a municipality's or region's transit systems, optimizing buses, rail, highways, waterways and airlines.
- **Electronic Health Record System:** Creating a standards-based infrastructure to support automatic updating of, and pervasive access to, personal healthcare records and the integrating of patient data with global payer/provider transaction systems.
- **"Big Green" Innovations:** Launching a new business unit in IBM that will focus on applying the company's advanced expertise and technologies to emerging environmental opportunities, such as advanced water modeling, water filtration via nanotechnology and efficient solar power systems.

In organizing a new innovation Jam for October 2008, like each previous one, the Jam will involve new, experimental approaches based on learning from the 2006 Jam. Instead of building from IBM's technology this time, IBM will start with customer needs. The Web pages from which people build ideas will be created based on IBM's latest Global CEO Study, a report based on a survey of more than 1,000 chief executives and other leaders worldwide (Bjelland & Wood, 2008).

### **IBM's Innovation Jam 2008 shows how far crowdsourcing has come**

The 2008 Innovation Jam was held in October, 2008. This year's event had nearly 55,000 participants from IBM registered and another 5,200 outsiders. Ed Bevan, IBM vice president of innovation and market insight, said that this year's jam was smaller in sheer numbers compared to the 150,000 participants in 2006 because it was more focused on the enterprise. The jam session took place over 90 hours. There were over 32,000 posts from nearly 90,000 login sessions divided into 2,750 themes and 2,310 threads. That doesn't include chat sessions, a new feature this year. It tapped employees from more than 1,000 companies across 20 industries— including thousands of IBMers—as well as independent authorities from a variety of fields, all over the world. Several of these independent authorities also played lead roles in guiding Jam discussions, such as subject-matter experts from Mars Incorporated, Eli Lilly and Company, Citigroup, and the Boston College Center for Corporate Citizenship.

Innovation Jam 2008 had a simple mission: turn the insights from IBM's recently released CEO Study, "The Enterprise of the Future"—based on interviews with more than 1,100 CEOs—into reality. The conversation focused on four major areas of inquiry (AOI), each reflecting a central "Enterprise of the Future" theme:

- Built for change: Organizing to lead waves of change by adopting collaborative business models and new approaches to harnessing disruptive innovation.
- Customers as partners: Effectively engaging a new class of informed, demanding and collaborative customers to differentiate products, services, customer experiences and a company's brand.
- Globally integrated: Tapping into new markets and talent by adopting new, globally integrated business models and partnering with global networks.
- The planet and its people: Building sustainable brands, products and services that attract a growing class of environmentally and socially aware customers, employees, investors and partners.

During the event, Jammers read through roughly 1.5 million pages. The average Jammer read 76 pages and spent just under two hours in the Jam, returning to the Jam on average eight times. Just under half the participants from client organizations were "active posters." The other half spent time only reading posts and did not contribute new ideas (see Figure 5-13).

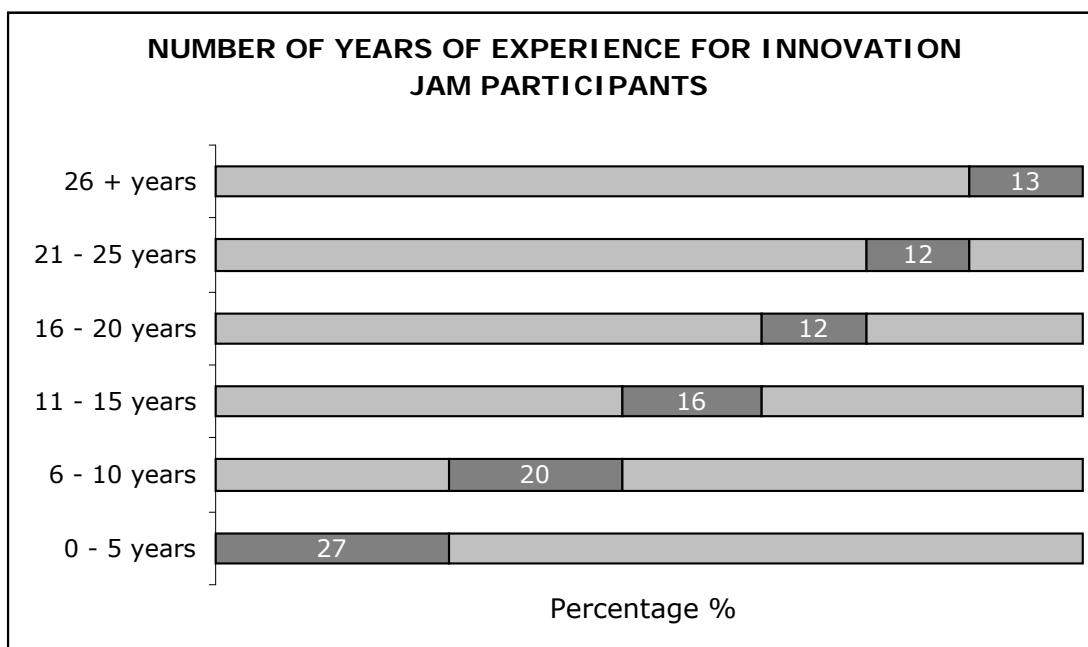
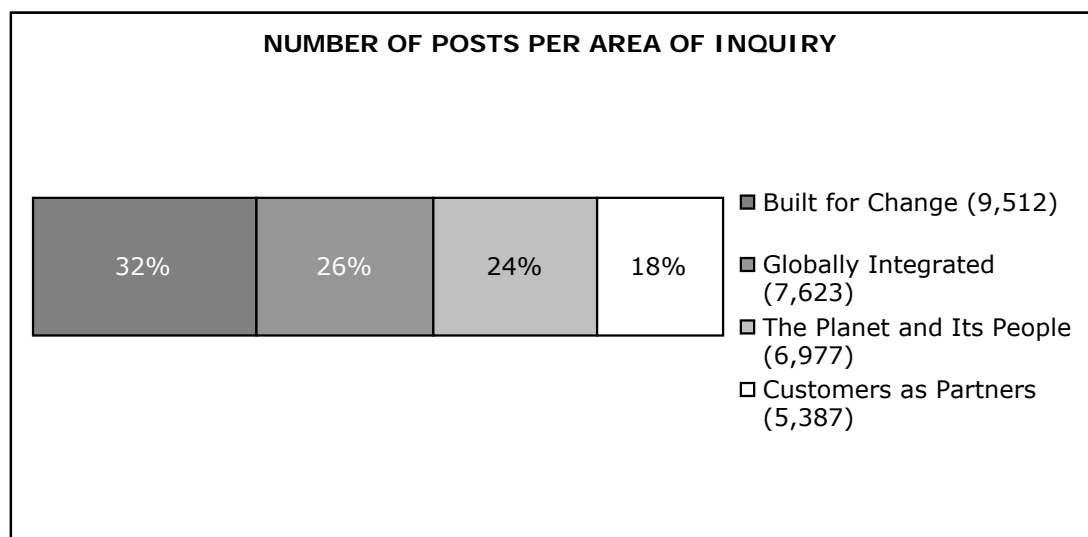
Participants had to sign a waiver that turns all ideas expressed into public intellectual property. The winning ideas can get funding, but, in contrast to InnoCentive the contributors of the ideas are not rewarded directly.

### **Results of the Innovation Jam 2008**

In 2009 a final report on the results was published (IBM, 2009). Again, the processing took weeks, consisting of an "insight phase" to figure out how to put the ideas into perspective and what to do with them. Dozens of senior execs reviewed the clusters of ideas and helped eliminate the noise. We will review some findings, mentioned in this report. We cannot be exhaustive, but will focus on a subject that affects the aim of this thesis research: how and why to involve customers in product development. These can be found in the report from pages N21 to N29 in the report (IBM, 2009).

Taken as a whole, Innovation Jam 2008 participants demonstrated a consistent ambition: to improve the way the world works by better observing, understanding and influencing systems of interconnected and interdependent elements. This goes beyond comparatively simpler tasks like system integration. In some cases, Jammers seized on the lack of connection between pieces of information that should be correlated (e.g., the cost of the water used to grow, process and ship a bunch of bananas with the price of those bananas at a local supermarket). In other cases, it was providing better information directly to potential users of it (e.g., real-time traffic analysis to people in transit). Some Jam conversations emphasized interconnectedness, such as that between the "people" elements of these systems. For instance, some cited the need for companies to work more closely with their customers, business partners and entire business ecosystem through shared risk models, employee exchanges and smarter monitoring across their supply chains. Others discussed better corporate interconnectedness with civil society to further inclusive, sustainable and profitable commerce.





**Figure 5-13: Some statistics (IBM, 2009)**

Jammers concluded that the enterprise of the future must immediately begin doing three things:

- Embrace a new level of transparency for itself and across the systems we are seeking to make smarter, allowing customers and partners to engage more intimately, and on a variety of levels;
- Increase efficiency in every aspect of its business operations, eliminate waste, and employ new and powerful monitoring and measuring techniques to make better business decisions; and
- Adopt corporate stewardship as a core business function, working closely with the public sector to build sustainable business practices that will improve global living conditions and drive positive social change.

Innovation Jam 2008 generated many specific ideas on how to turn this list of priorities into actions. For example, by making the product development cycle more transparent to customers, businesses could enable more “intelligent investing,” allowing investors to fund specific products, projects and ideas. Or by providing consumers with detailed, real-time supply chain information about their products, producers could achieve a new level of accountability and marketability.

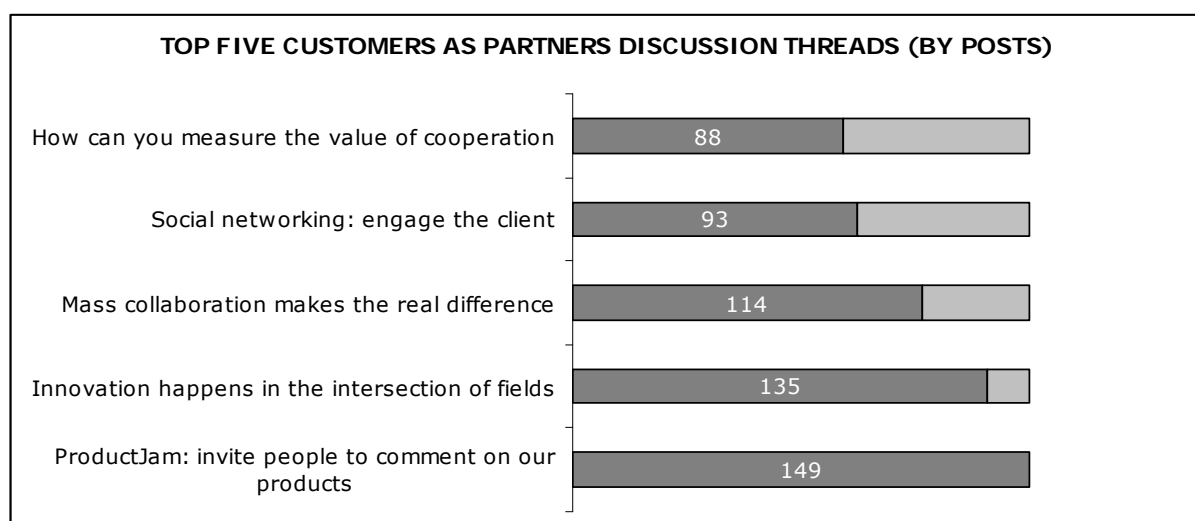
### ***Extreme transparency will drive more productive relationships***

Since the late 1990’s, enterprises of all stripes have been assaulted by waves of customer feedback. Thanks to the Internet—and more recently the popularity of Web 2.0 technology—what was once one of the most challenging aspects of the product development cycle has now become an embarrassment of riches. In fact, customer feedback is so abundant that it has created a problem of a different sort.

“Finding a way to collect the customer’s voice is easy,” said one Jammer. “What’s hard, in my experience, is finding the organizational will to give this laudable goal priority and make decisions on the basis of what the customer says.”

Jammers seemed to feel this “lack of organizational will” was linked directly to the issue of transparency. It’s too easy to dismiss customer opinions formed without full knowledge of the complex issues a company faces. But if companies were to “let the customer in”—i.e., be more open about the real constraints and at times opposing forces at work—true customer collaboration might ensue. And companies might be more likely to act on that customer collaboration, presenting the opportunity for deeper relationships, strengthened brand loyalty and perhaps even customers as co-creators.

Jammers envisioned progressive enterprises adopting unprecedented forms of transparency to fuel new kinds of interaction and engagement with their most passionate and knowledgeable customers. These relationships will be more trusting, loyal, productive and mutually profitable. To do this, enterprises will need to engage customers during all phases of the product development cycle. For example, customers could contribute ideas, invest time and money in developing those ideas, and then deconstruct and improve the final product after it has already gone to market.



**Figure 5-14: Top 5 discussion threads**

To many enterprises, this level of openness threatens long-held notions of intellectual property and competitive advantage. Jammers, however, proposed several thoughtful and innovative ways to leverage transparency and take customer co-creation to the next

level. Taken together, these approaches have the potential to significantly increase intimacy between businesses and their customers, and revolutionize how products and services are designed, produced and sold.

To Do List:

1. Allow customers greater visibility into all phases of the product development cycle, and encourage customers to invest in new ideas and products.
2. Provide customers with tools and mechanisms to contribute financially and operationally to product development.
3. Authentically engage a community of customer influencers to help guide future plans and to serve as candid advocates of your company's brand.

### ***Funding the ideas that customers care about***

Equities can be a rather blunt instrument as an investment vehicle. When you buy a share in a large public company, the success of your investment is dependent on a wide range of factors over which you have neither oversight nor control. But what if investors could engage in a much more targeted sort of funding? What if you could purchase shares in a product, a project or even an idea?

"Investors could choose from a portfolio of ideas offered by a company, rather than investing in a stock," said Joseph Russo, President, ZedX Inc., United States. "The customer, as an investor, would share in the profits of a successful idea. The value of an idea could be measured by the number of interested investors. By investing in an idea, a customer indirectly votes for a company's development path and shares in its risks and successes."

As Russo points out, one of the benefits of this "intelligent investing" is the market insight gained through the process. Allowing customers to vote on the potential of a new product or service with their wallets is the ultimate market research. Internally, companies could do the same thing by allowing employees to self-select the projects on which they wish to work.

Several Jammers took this thought and expanded it into a broader ideas market, where ideas from individuals could also be funded, independent from public companies. "It's a great way for companies or people to raise research and development funds, gauge the potential of an idea, and collaborate with customers," said Tasha Lopez, Software Account Manager, IBM, United States.

Of course, to get this kind of funding, companies or individuals will have to reveal more of their intellectual property (IP), and they'll have to do so earlier in the development cycle than ever before. New systems would need to be developed to handle the complexities of opening up multiple ideas to the investment market and tracking the respective results and dividends. However, the current global economic crisis is causing many established ways of operating to be re-examined. Compared to the alternatives, the IP challenges of greater co-creation and more targeted investing might come to be seen as relatively easy to overcome. And the rewards could be considerable: an explosion of corporate creativity.

### ***Designed to Deconstruct: Building in "tinkerability" from the beginning***

These days, it's not uncommon to buy a product, bring it home, and still not feel as though you own it. Some products carry with them a litany of restrictions on use, the violation of which will void the warranty or otherwise sever the relationship between the

consumer and producer. These “terms of use” limit the liability of the manufacturer, of course, but do they yield anything productive from the customer relationship?

“Why punish customers for taking apart products and modifying them?” asked Kora Bongen, Masters Student, University of Illinois at Urbana-Champaign, United States. “This kind of service promotes wasteful practices. And customer creativity could lead to a valued partnership. How might companies work with customers in a way that enables them to actually make their own repairs and prolong product life? And what benefit can the company get in return?”

It’s not as radical a thought as it seems. If the Internet Era—and the success of open source software in particular—has taught us anything, it’s that allowing for widespread, iterative innovation can be vastly rewarding. The Linux operating system, for example, is estimated to contain more than 283 million lines of source code, which would have cost more than \$5 billion to develop through traditional, proprietary means.

This concept applies to more than just software. To extend the mileage of Toyota’s popular hybrid vehicles, a company called A123 Systems has developed a rechargeable lithium ion battery that fits into the Prius’ wheel well. The product can more than double the Prius’ already impressive mileage.

To enable this kind of “tinkerability,” products themselves need to be designed for flexibility from the start. After-markets have existed for decades, but by making products easier to modify and providing tools for ample interaction between manufacturers and “tinkerers,” companies would have the potential to evolve products faster and capture more of their total value.

“I see too many businesses that end up in wars with their customers over things like how to use content or how to make modifications,” said Paul Brody, Partner, Global Business Services, IBM, United States. “These companies often find themselves in conflict with their most enthusiastic customers, the ones who use the product the most, understand it the best, and are most likely to dissect and modify it. All that innovation, and all the information generated by their use, should be used to best effect.”

### ***Search and Employ: Identifying and engaging community influencers***

Warren Buffett, the famous investor and CEO of Berkshire Hathaway, once famously said, “It takes 20 years to build a reputation and five minutes to ruin it.” But in the Internet Age, five minutes actually seems a bit generous. There’s no denying that branding and advertising are undergoing a stunning revolution. Brands are sullied in seconds on the blogosphere and through social networks. Social networks are very effective in scaling size and importance; every new person on a network doubles its value (Powell, 2009). Demand for some products can skyrocket before a dime of marketing money is spent. Identifying and engaging the connectors, mavens, and influencers (as popularized by Malcolm Gladwell in *The Tipping Point*) has never been more urgent.

“There must be some way to get to the actual data behind the social networks, to find out who is connected and how much real interaction there is between people,” said Andrew Vorster, Vice President, Technology Research & Development, Visa Europe. “That way you can identify the influencers and the followers in social groups, and target the influencers directly.”

And of course, bright people around the world are working on technologies to do just that. Part of the core Innovation Jam 2008 platform, for instance, is a tool named COBRA, (Corporate Brand and Reputation Analysis), from IBM’s Almaden Research Center. It can mine a wide range of Consumer Generated Media such as blogs, news

forums, message boards, and other Websites to discover how the social media-based community perceives a brand. The Cambridge campus of the Thomas J. Watson Research Center is exploring collaborative networks that analyze and map social networks, how they function, who serves as the all-important conduits and authorities within them, what their workings imply for workflow, etc.

Once a bona fide community of influencers is identified, companies must then empower and support it, providing influencers with product information, allowing them to help craft a narrative, and listening to their concerns and criticisms—in other words, companies must establish the right level of transparency with influencers. Courting this constituency can be fraught with danger, however. “Marketing pitches to bloggers can easily backfire,” warned Sacha Chua, Web 2.0 evangelist, IBM Canada. “Just because someone cares about your product doesn’t mean that they’ll say good things about it. You have to personalize your contact with them. Invite them to look at your product or service and share what they think. Be prepared for both positive and negative remarks.”

### ***Employee exchanges foster intimacy and innovation***

In business-to-business markets, companies can develop extraordinary levels of interdependence, a kind of corporate symbiosis. Key suppliers, service providers, consultants and other supply chain partners are increasingly forming global networks; thus there is a burgeoning need for higher levels of understanding among interdependent companies. Several Jammers gravitated toward the concept of employee exchanges as a means of strengthening those relationships and fostering co-creation.

This kind of exchange might be most appropriate for business partners that have particularly close ties, and long-term commitments to each other. But most importantly, any exchange program must have clear objectives for using the knowledge gained after the rotation ends. As one Jammer noted, “you want to make sure that the employee has the opportunity to feel and experience what it is like to walk in the client’s shoes,” but if you don’t have a deliberate plan to leverage this, it could be “a waste of time and money.”

## **Summary**

As we can see all the above mentioned ideas that were discussed during the Innovation Jam 2008 are highly correlated with the intention of this thesis research. It supports the problem, discussed in our introduction (see section 0), that management is in need of directions and guidelines on when and how to involve their customers in innovation initiatives. Transparency, open source approaches, the customer as employee, community diffusion and customer funding of innovations were some of the ideas in which IBM customers and employees suggest to apply customer co-creation in innovations.

### ***5.5.3 Key learning points***

#### **Context of the involvement**

##### ***Type of firm(s) and industry, economic and technological environment***

IBM is a technology based producer of IT systems, making it a highly complex and diversified company (heterogeneous market).

##### ***Source of the innovation***

Participating customers of Innovation Jam 2008 suggested many ideas for customer involvement making that innovation an externally sourced one. One idea even referred to

what we later call modding or hacking: experimenting with a new product (or platform) in such a way as to improve it.

### ***Type of innovation***

Emphasis in Jam 2008 was on process innovation, not on products and services.

This time (2008) IBM was not looking for 'ready to market' ideas, but more 'raw ideas'. In 2006 the search was for 'raw ideas'.

### **Customers which are involved**

#### ***Customers' expertise and competences***

It has been observed that the Jam was directed to customers and employees. As for the customers we are referring to business customers. It is, however not clear whether IBM was aiming to involve end users, the executive staff of the customer companies, or combinations of them. However, several clues in mentioned reports and in the SMR article – e.g. the large amount of participants – indicate that several end users of the customer companies have participated.

No particular skills are required from participants (see Figure 5-13).

As many participants as possible does not necessarily imply that more useful ideas are generated. Especially in online situations we will see that there are a lot of passive participants, the so called lurkers.

#### ***Engaging the customer***

The 2008 Jam engaged the customer by focusing on customer needs instead of on technology as in the Innovation Jam 2006. Although this resulted in fewer participants, the quality of ideas and discussions proved to be more worthwhile.

### **Process of involvement**

#### ***Timing of the involvement***

Involvement in the Jams was focused on the ideation stage of IBM's innovation process.

#### ***Roles and contributions of participants***

The task that is given to participants should be very specific, instead of too general. In the 2006 case people were asked to "give new business ideas", whereas asking for solutions for specific market needs would have been more useful. As we see, IBM has learned from this, posing more specific questions in the 2008 Jam.

In order to get participants build on each other's input it would have been wise to involve the participants in the refining and selection of ideas from the 1<sup>st</sup> phase as well.

#### ***Interaction/communication mode and intensity***

Using the internet has the great advantage of a large reach of possible participants, thereby reducing the risk of not having any input at all.

IBM wasn't prepared to act on the volume of good ideas generated in the 2006 Jam. The success of the first jam caught IBM by surprise and they weren't prepared for the large body of interest. Over time they have developed methodologies to effectively facilitate large groups to capture the ideas and refine them further.

Firms have to take into account that the evaluation process of crowdsourcing is labor-extensive. This is also the experience of Cisco, who undertook a similar initiative in 2007, the I-Prize (Jouret, 2009).

Moderation is required: participants have to be guided in the process; the process does not happen by itself. Training in advance in the process can be an alternative.

### ***Techniques and tools to support CI***

During ideation some form of physical or direct contact between moderator and participants is needed in order to understand and assess contributions properly. At least, a fast and instant tool for this understanding and assessment is needed, demanding careful preparation of the jam session.

## **5.6 LEGO**

### ***5.6.1 Introduction and background***

The following case description is based on (1) a personal interview of this thesis' author with Paal Smith-Meyer, a new product developer from the LEGO company in Billund, Denmark on June 17, 2008; (2) a presentation of Conny Kalcher, LEGO Vice President Consumer Experiences, at the European Networking Group Conference: Converting Consumer Insights Into Actionable Results, on March 5 & 6, 2009 in Amsterdam (Kalcher, 2008); (3) the company's profile brochure from 2009; and (4) some (magazine) articles or other literature (Antorini & Schultz, 2007; Lauwaert, 2008; Seybold, 2006; Terdiman, 2005).

LEGO was founded in 1932 by Ole Kirk Christiansen, a carpenter in Billund, Denmark who made wooden toys. Two years later, in 1934, the founder hit upon the name LEGO, which stands for Leg Godt and meaning "play well" in Danish. Since then the company has passed from father to son, and grown globally into the LEGO group, with approximately 5,500 employees nowadays. Today the founder's grandson, Kjeld Kirk Kristiansen – with his children – owns the LEGO Group, which in terms of sales lists in the world's top 5 largest toy manufacturers.

In 1948 Godfredt Kirk Christiansen launched the first LEGO brick, introducing the LEGO system, which means that many thousands of building elements can be easily combined in innumerable ways – and just as readily dismantled again. In 1958 it launched the LEGO brick with its new interlocking system, known as "System of Play". There are nowadays about 2,200 different elements in the LEGO range – plus 55 different LEGO colors. Each element may be sold in a wide variety of different colors and decorations, bringing the total number of active combinations to more than 6,000. At the start of the new millennium the LEGO brick was acclaimed "Toy of the Century" – first by Fortune Magazine and later by the British Association of Toy Retailers.

Concept and product development takes place primarily at the company's Billund headquarters – but the LEGO Group also has listening posts in Munich, Barcelona, Los Angeles and Tokyo in order to monitor the latest trends. The creative core is made up of 120 designers representing about 15 different nationalities. Most of the designers have been trained at design or art schools in various parts of the world. The LEGO Group, however, does not formally stipulate that its designers must have such training; selection is based on hands-on work and face-to-face interviews (Company Profile, 2007). LEGO products are developed in such a way that there is something for all ages and stages of development. The LEGO Group has developed and marketed a wide range of products, all founded on the same basic philosophy of learning and developing – through play. In the

first era construction and building fun were the central elements in play. In the second era LEGO products gained motion with the introduction of wheels, small motors and gears. Role play and themes formed the basis of the third era – and LEGO figures were born. A fourth era followed, with intelligence and behavior becoming an integral part of LEGO products in MINDSTORMS, a integration of robot technology with the LEGO construction system, emerging from a partnership with Massachusetts Institute of Technology. MINDSTORMS is a system that enables construction and programming of working robots. Its core is the NXT programmable brick that contains an 8-bit processor, memory, and interfaces. To help children of all ages program the robot to perform the desired tasks, LEGO XNT Software provides a graphical user interface for customers of all skill levels, while NXT'reme is a firmware developer's kit for advanced users. The BIONICLE universe made its appearance in 2001. It was the first time the LEGO Group had developed a complete story from scratch as the basis for a new product range. Through a combination of physical products and a detailed online universe, children are invited to tell how they see the story and the action developing. With the BIONICLE range the LEGO Group brought a brand-new category to the toy market: Constraction, which is a combination of "construction toys" and "action figures". The knights of the Knights' Kingdom range were later added to the Constraction category.

### ***5.6.2 Case description***

#### **Brand revitalization by listening to the customer**

In the beginning of the new millennium the company suffered severe financial losses – a \$238 million loss in fiscal year 2003 (Koerner, 2006), resulting not only from competition in the toy market, but rather from too much diversification in other services, such as LEGOLAND (Lauwaert, 2008). But, even more important than that, LEGO realized that it had forgotten a large user group with much influence (Antorini & Schultz, 2007). A specific incident of an order cancellation by an adult fan and well known to the CEO of LEGO (It all started with Richard James; Conny Kalcher, 2008), but which went unnoticed by the advisor who took the complaint call, and several hacking incidents with some new products made the company aware of the distance it had created between LEGO and its customers. These customers were trying to tell LEGO what was going wrong. Luckily for LEGO, it listened to these fans. It found out that the creative play within the building system of LEGO was the most valuable authentic strength of the company. The focus on the construction process as the most precious part of the LEGO brand was reestablished as were a number of initiatives, like fan communities and the possibility to order customized boxes of LEGO. This was manifested in LEGO's Consumer Experiences, entailing the vision to know the consumer and showing it by deepening the emotional belonging of its consumers by delivering and co-creating relevant, personalized, and unique LEGO experiences consistently across all LEGO touch points (Kalcher, 2008). The LEGO Group tried to meet this challenge by binding consumers, fans and retailers even closer to the organization by listening better to them. As far as consumers are concerned, the most visible changes have taken place in product development, as described above. But, it also led to a more profound engagement of LEGO in many initiatives to strengthen ties between LEGO enthusiasts and the company, such as user communities. It tries to communicate on a one-to-one basis with its community members and lead users, in order to try to move all other users into that position of LEGO fan or lead user. As Conny Kalcher put it: "LEGO Fans know our product better than us" (Kalcher, 2008). In 2005 the LEGO Company announced that the 'LEGO Group is on the right track' with a net profit of DKK 505 million (US\$112 million). In 2006, the net profit had almost tripled to DKK 1430 million (US\$291 million) (Lauwaert, 2008).



## **LEGO Communities: sources for innovation**

We will now review some of these communities briefly, sourced by the company profile brochure and some presentations. We cannot be exhaustive, since LEGO's community is very large and diverse (see Figure 5-16).

### ***LEGO.com***

LEGO.com is the official website of the LEGO Group. The aim of LEGO.com is to create a virtual LEGO universe in which users can enjoy one of the most intense LEGO experiences. LEGO.com is more than just an online shop. It is a place where children, parents and LEGO fans of all ages can play and learn about LEGO Group values and ideas through games, stories, activities and experiences. More and more people are clicking their way to LEGO.com, and the website now tops the list of family and children's sites on the Internet. In 2006 LEGO.com was one of the top 25 "Lifestyle and children's websites" in the US. In 2008, LEGO.com had an average of 18 million aggregated daily unique visitors per month. The visitors spent an average of about 14 minutes at LEGO.com. On top of the list were BIONICLE pages - attracting an average of 2 million aggregated daily unique visitors per month.

### ***LEGO Club***

The LEGO Club started in 1997 and is for children in the 6-12 age groups and has a membership of 2.7 million. Through the LEGO Club, members can show each other pictures of their favorite building work and draw inspiration for future play. Every 2-3 months members receive a members-only magazine, published in English, German, French and Dutch. They also have access to a special LEGO Club website. LEGO Club membership used to be free, but since 2001 members are required to pay, only to increase membership numbers.

In 2004 a new club offer was launched in the USA: LEGO BrickMaster, aimed at children aged seven years and upwards. The new offer is an option for the most enthusiastic members, who can access an even broader range of LEGO activities. For the first time, children can have a selection of LEGO products supplied regularly to their home address. In addition, they receive special information and behind-the-scenes LEGO stories plus the opportunity to take part in special competitions.

Within the LEGO Club, a community of core kids has emerged, the LEGO Kids' Inner Circle, which gives those kids a premium experience and keeps them engaged. LEGO tries to use their deeper understanding gained from the dialogue it has with these kids to make concepts and campaigns that are relevant to the core, and to drive innovation. In this Kids Inner Circle, members can make use of an own, adaptive blog, news and quick polls, surveys and there is a special portal to submit ideas. To determine who participate in this Inner Circle, LEGO monitors LEGO brickmaster and LEGO Club. The Inner Circle currently covers only the US and UK children.

LEGO monitors this community in a great extent. Through techniques such as participatory observation ("Be the Kid"), observation & desk research ("Know the Shopper"), context research ("Find the Forces", "Find the Stories"), ethnographic research ("Find the Fun"), and innovation diagnostics ("Map the Industry") insights are gathered.

### ***LEGO Factory***

The LEGO Group now gives children the opportunity to build their own virtual models on the computer – and then have the bricks to the physical LEGO model sent by post. At [www.LEGOfactory.com](http://www.LEGOfactory.com) children and other building enthusiasts can build virtual LEGO models using the professional software application, LEGO Digital Designer. Consumers

can design and build precisely the model they think is lacking from the official LEGO range. Each builder then decides whether he or she wants to buy the model or simply exhibit it in the digital gallery for other visitors to admire. The aim of the website is to introduce a whole new dimension to the fun of building. If children are looking for advice or ideas, they can see inspirational material at the site posted by LEGO designers and adult LEGO fans.



**Figure 5-15: LEGO Factory website**

LEGO Factory offers 2 types of experiences: (1) LEGO Factory Exclusives, where user developed and LEGO published creations are found, and; (2) LEGO Factory My Own Design, where user developed creations can be published by its creator, the user. Customers often enjoy creating their own designs. Sometimes this is out of necessity—they have a problem or opportunity that cannot be addressed well with a standard "off the shelf" design—but often they simply enjoy the opportunity to employ their creativity to design something new. This latter market is the target for LEGO products. LEGO Group therefore provides tools that help users design products to their personal specifications. The LEGO Factory is a system for designing with LEGO products. At the core is LEGO Digital Designer, a software tool that anyone can download from [www.lego.com](http://www.lego.com). It enables the user to create elaborate virtual designs much more quickly than physical designs. It also enables the user to test different scenarios and perform "what if" tests before committing to a physical realization. Once the user is satisfied with the design, LEGO Digital Designer provides the information required to order the parts online.

On top of having had one's own design exhibited and taken into production for use by others, one can apply for the LEGO Factory Design Competition. Winners will be displayed in the Gallery of Winners. The winning 10 models are sold as LEGO models, with the creators earning 5% of the revenues and having their name displayed on each box sold (Smit, 2006). The company is keen to expand the initiative.

### ***LEGO Inside Tour***

Twice a year it is possible to join a very exclusive visit to the LEGO Group and be shown round the company. Enthusiasts from all over the world take part in these Inside Tours. During the tour, visitors have close-quarter encounters with product developers, designers and model makers, who introduce the fans to a themed building competition with LEGO bricks. These special visitors also learn about the company's history, culture and values – and get to see behind the scenes at LEGOLAND Billund. It is a special opportunity to see parts of the company which are otherwise closed to the public.

### ***Adult LEGO fans and LUGNET***

A growing number of adult LEGO enthusiasts have been setting up groups (LEGO User Groups - LUGs) in which to share their LEGO hobby. They call themselves "AFOLs" ("Adult Fans of LEGO"). One of these AFOLs formed the rec.toys.lego newsgroup circa 1993, to share descriptions of their LEGO creations with other hobbyists and to buy and sell LEGO bricks and pieces directly from one another. In 1996, Todd Lehman and Suzanne Rich, maintainers of separate LEGO fan sites on the Net, embarked on a collaborative project to build a site that would be the central location for the community of LEGO fans. This was the beginning of LUGNET, which was officially announced on rec.toys.lego on October 1998. LUGNET consolidated both the communication forums and the dispersed informational fan sites that had been developed worldwide. As an independent site created for fans by fans, LUGNET provides a wealth of collective knowledge of LEGO product lines and themes, long-term focused group discussions and activities and a forum for the exchange of LEGO bricks. Any LEGO fan can browse through the collected information on LEGO themes produced throughout the years. Registered LEGO fans can share information about the themes that they own, as well as engage in long-term relationships with other LEGO fans. There are more than 3,800 registered members from over 70 countries as of January 1 2010 exchanging information through the 838 newsgroups on the site.

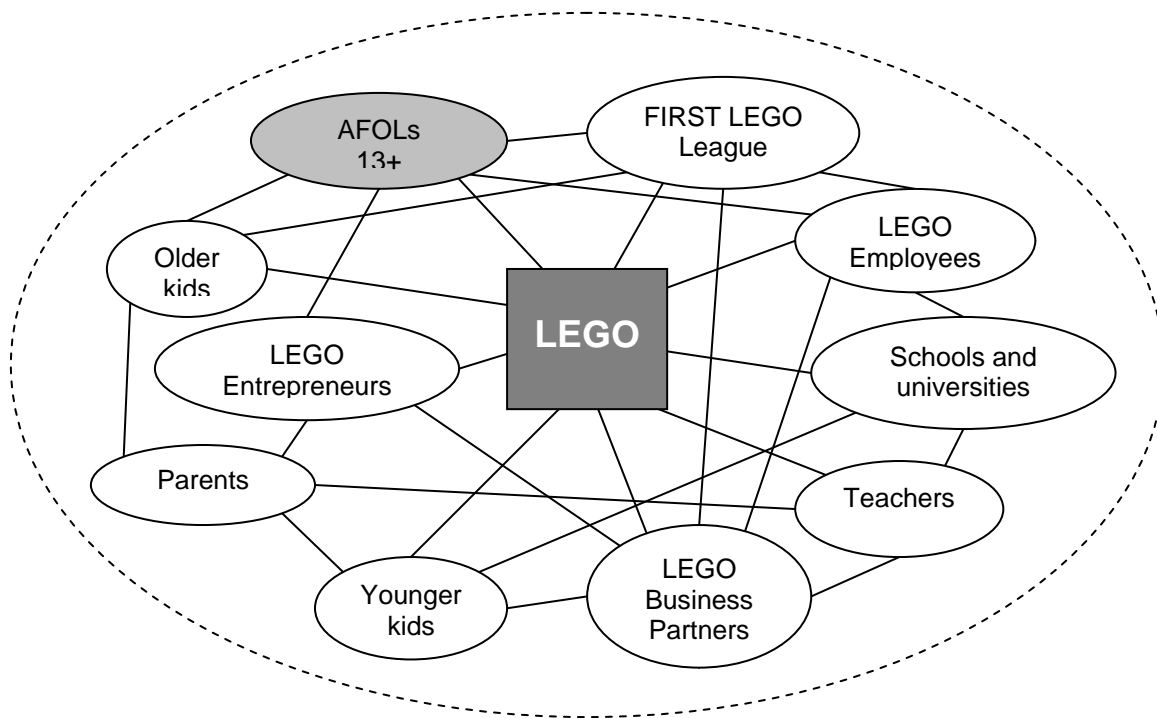
On December 9, 1999, Brad Justus, Senior Vice-President of LEGO Direct, announced on LUGNET and the rec.toys.lego newsgroup, that the company was "listening" to its adult fans. LUGNET and rec.toys.lego were at that time the two main electronic communities of adult fans of LEGO. When LEGO Direct told LUGNET and rec.toys.lego that the company was listening, it received more than 200 responses from LUGNET members within the first two days. LUGNET created a forum specifically for direct communication between LUGNET members and LEGO Direct. The forum is relatively active, with more than forty messages posted on a given week, placing it within the top twenty forums in terms of message traffic. Although the number of LEGO Direct employees is small (4) in comparison to the number of LUGNET members on the forum (396), the LEGO Direct employees have posted on average 14 messages to the forum since its inception, whereas an average LUGNET member has posted 5 to 6 messages. LEGO has already introduced at least one new service as a result of issues raised by LUGNET members (Moon & Sproull, 2001).

Over a period of years, the LEGO Group has actively developed relations with more than 50 "AFOL" groups with a total of 40,000 registered members. The groups have their own websites, blogs and discussion forums. The most popular LEGO fan blogs have more than 100,000 unique visitors each month. LEGO fans are also very active at YouTube where more than 130,000 LEGO tagged videos are to be found.

In 2008 more than 100 public events were organized by LEGO fans, and more than 1 million people (typically families with children) visited these events. During 2008, LEGO business units and LEGO User Groups collaborated on 50 projects – from events to development issues.

### ***FIRST LEGO League***

The adult MINDSTORMS community has created a number of alternative programming environments and written more than 40 books about MINDSTORMS. From the pilot in 1998 with 2000 kids in 7 states, the FIRST LEGO League Program now consists of over 100,000 children from more than 40 countries in the world. They are supported by more than 35,000 adult volunteers.



**Figure 5-16: The LEGO Community (source: LEGO profile brochure)**

#### ***LEGO Ambassador, Professionals and Universe Partners Programs***

In 2005 the LEGO Group announced its "LEGO Ambassador" program for AFOLs worldwide. The purpose of this program is to expand mutually useful relations between the LEGO Group and its loyal, talented and committed consumers. Each LEGO Ambassador Program cycle is one year. LEGO Ambassadors are selected by the LEGO Group based on nominations from LEGO User Groups. The current LEGO Ambassador Program cycle has 40 members from 22 different countries all over the world. All LEGO Ambassadors members are expected to exemplify the program fundamentals of building proficiency, enthusiasm, and professionalism towards the public, other fans, the LEGO community and the LEGO group. In addition, LEGO Ambassadors members agree to be active contributors to the LEGO world-wide community by: contributing regularly to online discussions, participate in local user groups, or help to start one in the local area, and advice new fans just joining the hobby (<http://www.lego.com/eng/info/default.asp?page=ambassadors>). Being a LEGO Ambassador does not cost money but only a few people are selected each year. Joining the LEGO Certified Professionals program costs US\$1000 a year but more people can apply for this title (Lauwaert, 2008). Some LEGO fans have turned their passion for building and creating with LEGO bricks into a full-time or part-time profession: LEGO Certified Professionals who have been officially recognized by the LEGO Group as trusted business partners. Today there are 9 LEGO Certified Professionals. The program was extended by 3 persons during 2008 (see

<http://www.lego.com/eng/info/default.asp?page=affiliates>). At an early stage of the LEGO Universe project, back in 2006, it was decided - subject to a confidentiality declaration - to include a group of adult LEGO fans in the development project. At present, the LEGO Universe Partners program (LUP) has approx. 50 active participants.

## **User involvement in Product Development or Innovations**

### ***LEGO Factory's Digital Designer***

LEGO Factory exemplifies how mass customization as well as customer co-design is utilized efficiently. LEGO offers people a possibility to create their own unique LEGO model using interactive software on their web sites. Then, LEGO manufactures the bricks necessary for the model and ships them to users so they can assemble their models. Customers can also buy the bricks necessary to build from other people's designs, which are posted on the site. When LEGO Digital Designer was first released, several users noticed that it resulted in ordering many more bricks than were actually needed to build the design. One of the users made modifications to the software that enable customers to order smaller quantities (ultimately by unit rather than by the bag). The LEGO Group recognized that the software modifications ultimately benefited customers, and it did not intervene, but embraced the innovation (Terdiman, 2005). This LEGO example demonstrates how communities can act efficiently in problem solving when they have a shared goal, which in this case was to be able to design LEGO models and buy their own LEGO bricks with affordable price. Customers weren't satisfied with tools offered by LEGO and decided to improve them. In other words, customers were given possibility for higher participation but they wanted and took even more (Mäkipää et al., 2006).

### ***Design contests***

The LEGO Factory enables a designer to upload his/her designs to [www.lego.com](http://www.lego.com), where they are then displayed in the Gallery, together with the name of and personal comments from the person who submitted them. Similarly, the Web site includes "NXTLog," a forum for showing off one's robotic creations in the MINDSTORMS category. Going one step further, LEGO Group also sponsors design contests with prizes. The user community itself is taking the lead in providing recognition. There are numerous independent sites for displaying one's designs and judging the work of others. Several contests and conventions are organized by independent groups, such as FIRST LEGO League and BrickFest.

### ***MINDSTORMS product development***

When MINDSTORMS was first launched in 1998, users hacked the software to expose some of the proprietary APIs (application programming interfaces) and enable programmers to extend the software in ways LEGO Group never imagined. The MINDSTORMS community has always been active and has, through the hacking and modifications 'done far more to add value to LEGO's robotics kit than the company itself.' At first the attitude was wait-and-see, but eventually - after almost a year - LEGO Group concluded that these hacks were resulting in creative new robot designs, furthering the original MINDSTORMS mission of encouraging exploration and ingenuity (Lauwaert, 2008). So, LEGO decided to open up the source code for the community despite strong concerns from the legal department.

When LEGO was ready to develop its next generation MINDSTORMS product, they invited the lead customers, who were involved in the hacking of the first generation, to co-design the next-generation product with them. With the design of MINDSTORMS NXT LEGO hosted a two-day workshop at MIT with a group of end-users whose opinions they valued in January 2005. The workshop produced numerous ideas and considerable feedback on initial design ideas. LEGO Group then developed a list of 20 top end-users,

then hand-selected the top 5. This effort resulted in a panel of four lead users who helped design the MINDSTORMS NXT. Dubbed the "MINDSTORMS User Panelists" (MUPs, or "Muppets"), the panel first provided its "wish list" of features and capabilities. As the design progressed, LEGO Group sent out specifications, then prototypes, for the panel's review and feedback (Seybold, 2006), extending the number of participants to initially 11 key users (November 2005), and later by beta-testing to 100 (March 2006) (interview Smith-Meyer).

When two of the panelists attended a MINDSTORMS tournament at LEGO Group's headquarters, the MINDSTORMS team asked them to stay on for an extra day and proceeded to take them into the labs—the "inner sanctum" for research that was normally off limits to non-employees. Their observations in the lab resulted in additional design changes (Koerner, 2006). This example illustrates the extent to which a company can reach out and engage its lead users. LEGO Group's recruiting of hand-picked lead users and involving them in all facets of the design is also a good example of including customers on the design team. These lead users were selected based on their demonstrated ability to produce advanced designs with the first-generation MINDSTORMS product, and, as a group, they had complementary expertise. They were integrated into the design process by providing them with plans, preliminary specifications, and prototypes for review and comment. By being a select few (four), they were made to feel special and important. Giving them VIP treatment (e.g., taking two of the members into the "inner sanctum") provided further reinforcement. Importantly, not only are the fans invited to sit at the table with LEGO designers to help design new products, LEGO employees increasingly venture outside of the company by taking part in user groups and posting on fan-sites, by data mining personal websites and fan community databases, by announcing new products and programs on private initiative websites (Lauwaert, 2008).

### **5.6.3 Key learning points**

#### **Context of the involvement**

##### ***Type of firm(s) and industry, economic and technological environment***

Similar as with DE, LEGO is global operating company that offers more than just the LEGO brick as a toy for children. The product has been developed through the years to offer a variety of appliances, services and, ultimately, experiences, but not just for children, but adults as well.

It can also be observed that until the turn of the century, LEGO followed a push strategy where the company itself developed the new products and took care of its introduction. Nowadays customers are involved in these innovation activities, clearly as an important part of its customer orientation, which had been lacking in the previous century. But, the customer orientation is not limited to involvement in product development – we see that LEGO deploys several ways, like company tours, LEGOworld events in many countries, etc. to engage the customer and get to know him or her better, while creating experiences for the customers, which increase their loyalty.

##### ***Source of the innovation***

This focus on the customer has developed into a situation where most innovations are customer-driven, i.e. users are the ones that usually come with the ideas for new developments and improvements. LEGO has made it a central aspect of its strategy to monitor and receive these user-driven ideas on a continuous basis. By issuing contests LEGO encourages users to come with new ideas.

### ***Type of innovation***

The LEGO Factory exemplifies how mass customization as well as customer co-design is utilized efficiently together. The LEGO brick acts as the basic module with which to mass customize the designs. The bricks in their selves are also subjected to innovation. Throughout the years there have been changes (innovations) in sizes, shapes, colors, and materials where users have also been at the foundation of the innovation. An example in this respect is the recently (July 14, 2008) launched LEGO Architecture, for which a LEGO brick had to be adapted in order for it to be used to create architectural designs (interview Paal Smith-Meyer). But, as we have seen, customer involvement can also lead – intentionally or unintentionally – to process innovations, as was demonstrated by a LUGNET user with the packaging and delivering of bricks for models, designed through the Digital Designer.

This strategy to draw on user-created content to improve products and create a solid fan base and loyal community is common among computer game developers but new to the LEGO Company that has a rich history of lawsuits against companies or persons unlawfully using their products or brand. Contrary to most game developer companies who leak information and sometimes software code about a game as soon as possible to generate a buzz, the LEGO Company opted for secrecy among the MUP until an approved prototype was ready for the 'big bang.' Again in line with the production process of computer games, the LEGO Company then asked for 100 beta testers who would be able to buy a pre-release of the product at a discounted price in return for four months of heavy tinkering and providing the company with feedback (Lauwaert, 2008).

### **Customers which are involved**

#### ***Customers' expertise and competences***

LEGO recognizes a certain hierarchy in its users regarding their commitment and propensity to participate in product development. This is translated in the discussed Ambassadors and Universe Partners or User Panelist Programs. Although all users or customers are regarded as a useful contributor to LEGO product development, the type of contribution depends on the position in that hierarchy, where Universe Partners have the largest influence in product development and ordinary users the least.

The LEGO Universe Partners are also called lead users, as derived from von Hippel. But to our knowledge the two criteria that von Hippel attributes to lead users cannot be recognized from these users. It looks as though LEGO combines activity, experience and specialism as criteria for becoming a lead user. Identification of such users is in terms of LEGO 'easy' since it monitors all user communities itself (interview Paal Smith-Meyer), and the fact that most communities require authenticated membership (Moon & Sproull, 2001).

#### ***Engaging the customer***

Each contribution to the LEGO community website (e.g., catalog, old LEGO building instructions or design) is attributed to the individual who developed the content or model. This way the contributors receive credit for their contribution, an almost costless incentive by LEGO. Community members share a passion for building LEGO models. Members list the LEGO sets they own and their favorite LEGO themes on their profile pages, but they do not receive any payment from LEGO for this advocacy. Universe Partners who have participated in product development pay their own traveling expenses when invited to LEGO in Billund (Koerner, 2006), whatever their descent. As we have seen, user designers receive a share in the royalties in the case their designs are ordered by other customers, but as research has shown, they do not design because of this monetary reward (Antorini & Schultz, 2007). Voluntary community contributions can

result in recruitment by related firms, e.g. one of the early members of LUGNET and a volunteer administrator of a LEGO used-parts marketplace, was employed by LEGO (Moon & Sproull, 2001). An often-heard critique on user-driven innovations, on bringing the users into the company, on tapping into the 'many-to-many' community, is the 'free labor' critique. Soren Lund, LEGO Mindstorms Product & Marketing Development Director, remarks in an interview with Joel Greenberg that this free labor is not necessarily cheap to tap into for companies because a lot of the company's energy and resources are invested in working with user communities (Greenberg, 2006). More importantly, it is exactly the fact that users are not being paid to co-design a new product that makes this system work, according to Lund. Paying users would reallocate them from the communities' 'can culture' to the companies' 'must culture.'

## **Process of involvement**

### ***Timing of the involvement, roles and contributions of participants***

One of the advantages of an active user community is invaluable feedback about the products being used by these users. In the 2006 LEGO annual report, this feedback is referred to as 'unique' and 'extremely significant' knowledge 'of the wishes and needs of the users.' This knowledge is used in both the development and the marketing of new LEGO products. Closing the gap between company and consumer through loops of feedback is a means to include the consumer in the magic circle that is a brand and to keep that brand vital. By including the consumers in the design of MINDSTORMS NXT, by shortening production processes so as to be able to react faster to changing trends, the LEGO Company tries to re-establish its brand as dynamic and vital and it tries to institute a participatory relationship with the consumer.

By tapping into the culture of user-driven innovations, the LEGO Company also wished to change its marketing strategy from the traditional commandeering marketing strategy to a collaborative, viral marketing strategy. This seemed to work, when the word got out that MINDSTORMS fans were sitting at the table with LEGO officials to design NXT, the Internet buzz seemed unstoppable (Lauwaert, 2008). We therefore observe that users are also involved in the commercialization stage of the innovation.

The MINDSTORMS example illustrates the extent to which a company can reach out and engage its lead users. LEGO Group's recruiting of hand-picked lead users and involving them in all facets of the design is also a good example of including customers on the design team.

Roles and contributions depend on the hierarchical position of the customer; see under 'Customers' expertise and competences'.

### ***Interaction/communication mode and intensity***

The two LUGNETTM cofounders spend on average 10 hours a day maintaining their community site, indicating that interaction is not only about company-customer communication, but also about customer-to-customer (C2C) communication.

It can also be observed that where the company-to-customer interaction is concerned, that LEGO tries to make it standard practice to conduct a dialogue with all submitters. Ideas or creations are acknowledged on reception, the processing is communicated and the final outcome (winner or no-winner) is also communicated.

And finally, incorporating lead users in the design team is a far stretching way of an intense communication with participating customers.



### ***Techniques and tools to support CI***

A very important aspect of the strategy of bringing the fans into the company and tapping into their creative potentials is community building, providing a fertile basis for the user communities to thrive on. LEGO Factory is one such a tool (and so are the competitions, exhibitions, building events and official websites for product series where users can create their own websites sporting their own designs). Concerning LEGO Factory, it is important to note that such digital design tools have already existed within the adult user community for a long time. LEGO fans have been using Computer Aided Design programs, such as Ldraw, SimLego, LeoCAD, Bricksmith, BrickDraw3D or MLCAD since the mid 1990s. These programs were created by users and are still preferred over LEGO Digital Designer by many users because they have more viewing options, colors, bricks and design flexibility. This is not entirely surprising since LEGO Digital Designer is targeted at children and new users (Lauwaert, 2008).

## **5.7 Conclusion to this chapter**

The cases, selected for their diversity, reveal the opportunities and challenges of customer-inclusive innovation. Customer involvement was at least a partial success in all cases. At the same time, it was never a 'silver bullet' to permanently transform the way the company worked – even in the P&G case, change was a result of its Open Innovation approach and not because of the involvement of end users. In the cases of the CCCL and DECS customer involvement was a one time, almost ad hoc phenomenon, while in the cases of LEGO and P&G customer involvement has become a way of doing business. However, at the present day DE has re-deployed the customer involvement approach at least two times<sup>20</sup>, demonstrating that CI can repeatedly be deployed. Therefore, CI seems to be capable to support both incidental and repeating innovation initiatives of a firm.

Another observation is that, whether a B2B (IBM, DECS) or B2C (LEGO, P&G) type of firm, a manufacturer (P&G, LEGO) or service provider (IBM, DECS), small (CCCL) or large (P&G, LEGO) firms, all seem to be capable of and suited for CI. However, the cases described here do not demonstrate whether a non-profit or governmental organisation could also benefit from CI, but in several cases from Appendix D support and proof for this opportunity is given. Common in all cases, however, is that the organization's offerings and markets should be heterogeneous, thereby containing opportunities to either develop line extensions or really novel (radical) offerings. The technology base of the organization, however, does not seem to be a prerequisite, as demonstrated by the CCCL and LEGO case.

Another theme cutting across the cases is the nature of an 'innovation community'<sup>21</sup>. The LEGO Mindstorms case is a good point of departure. There, representatives of different user communities came together to elaborate innovative new concepts. In contrast, the CCCL case featured an 'innovation community' that was centered on the developer company and focused on a specific task. Ad hoc users were enrolled to generate new ideas, test new concepts and such for the company's product development for a short

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<sup>20</sup> DE launched at least two initiatives for customer co-creation: (1) a so called challenge to invent a new way of drinking tea via an intermediary, RedesignMe in 2009 (see <http://www.redesignme.com/challenge/495>) and (2) a coffeepanel in 2009 among Libelle readers to develop new coffee tastes for Senseo (see <http://www.libelle.nl/category/senseo-testpanel/>).

<sup>21</sup> The term 'innovation community' to refer to the organizations directly and indirectly involved in the commercialization of a new technology (Lynn et al., 1996).

period of time. Even with this limited engagement, users did manage to participate (Lave & Wenger, 1991) as designers interpreted and turned their input into product characteristics. The P&G case takes the theme of innovation community considerably further. Professionals had already prior to the declaration of P&G's Open Innovation strategy formed collaborations and attempts to develop suitable solutions. When the company joined in, it brought in more resources and started to coordinate and bring together the partially diverging interests of the CoPs of various specialists in the world. This is close to how 'innovation community' tends to be portrayed in the literature. It was a sustained group of representatives of several pre-existing CoPs, many of which included proficient lead users, coordinated by a highly motivated and resourceful company to develop a specific innovation. The LEGO case reminds us that CoPs are not mutually exclusive: the developers were simultaneously able participants in the application CoPs for which they designed their innovation. Such simultaneous membership in multiple communities goes beyond the portrayal of innovation communities by von Hippel (2005) and colleagues as both manufacturing and user domain expertises are fused in a set of people sitting on two chairs.

As for the relationship between innovation type and type of customer, the cases undoubtedly demonstrate that 'ordinary' users can provide useful input to develop radical or novel innovations. Keeping in mind that co-creation aims at collaboration between the firm and external sources, we see that in the case of CCCL ordinary families support the product development of SMEs with the elicitation of – until then – unknown needs and wants. The AFOL-community of LEGO, consisting of both ordinary and lead users, provides the company with new ideas for offerings, while lead users (MUPs) were employed in the design and development activities of the company. In Connect+Develop many of the innovations are based on inputs from or developed by professionals in the field, but the program does not neglect the input of consumers or ordinary users.

The cases also demonstrate that nearly all innovation activities can be conducted with the involvement of customers, including needs assessment (CCCL), ideation (DECS, LEGO, IBM, P&G), the screening of ideas or concepts (DECS), concept testing (CCCL, DECS), design and development (LEGO, P&G), the commercialization of the innovation (LEGO) and even the re-innovation or use stage (LEGO). So, although one could get the idea of CI being of particular interest in the front end of an innovation stage, we see that in all later stages CI can be beneficial as well.

Typical across all cases is also the contingency of the channel of involvement (online versus face-to-face) with the amount of customers involved, which we have typed as the degree of openness. The more people are involved, the more open (no secrecy) the involvement is and the more the involvement is obtained through the online channel, either with communities (LEGO) or on an open call (see examples in Appendix D). Conversely, the less participants, the more secrecy is needed and the sooner the physical presence seems to be imminent in participation (LEGO MINDSTORMS, DECS, CCCL). The only exception seems to be the P&G Connect+Develop program, but when reading the case carefully, one can conclude that the submission of the idea may be open and therefore available for many participants, however, when of interest and selected for further development by P&G, activities take place in seclusion, behind closed curtains.

Finally, regarding the use of tools it can be concluded that sophisticated methods for user involvement are a complement rather than the sole source of user information. In the cases that relied more on explicit technology-based tools (IBM, LEGO Factory), the tools only partially compensated for the relatively short duration of interaction in the innovation activities. More important seems to be the occurrence of a dialogue between firm and participating customers, implying that the quality of the interaction depends on mutual trust, appreciation, commitment and equality. Tools that support this dialogue,

such as the ZMET™, OBR, or similar techniques, seem to be important to assure effective and efficient contribution from customers.

More cases are listed in Appendix D, all of them, together with these six cases, demonstrating that customer involvement can take place in different business contexts, industries, innovation types, customer contexts and stages of the innovation process. Harnessed with this insight we can start designing our protocol, first by stating the design requirement. This will be done in the next chapter.

# Chapter 6 Protocol requirements for customer co-creation in product and service development

## 6.1 Chapter introduction

In this section we present essential requirements for the development of a protocol for companies that wish to involve their customers into co-creation in innovation projects. These can be derived from the innovation process and its links to product development process and strategic management and the characteristics of industries, products and product development. We also utilized the common innovation problems of companies when deriving the requirements.

The focus of this research is on the design of a protocol. There are protocols for information technology and for human behavior. We will aim our protocol on the latter meaning. In this case meaning that we will aim at shaping managers' behavior when they involve customers in their innovation processes.

Protocols for human behavior are applied in diplomacy, medical contexts and in sciences. A protocol in science and medicine is a formal set of rules and procedures to be followed during a particular research experiment, course of treatment, etc. or a detailed plan of a scientific or medical experiment, treatment, or procedure (Merriam-Webster Dictionary). In medical science a clinical protocol or clinical practice guideline is a document with the aim of guiding decisions and criteria regarding diagnosis, management, and treatment in specific areas of healthcare (ICH Expert Working Group, 1996). Modern medical guidelines are based on an examination of current evidence within the paradigm of evidence-based medicine. They usually include summarized consensus statements, but unlike the latter, they also address practical issues. In the natural sciences a protocol is a predefined written procedural method in the design and implementation of experiments. Protocols are written whenever it is desirable to standardize a laboratory method to ensure successful replication of results by others in the same laboratory or by other laboratories. Detailed protocols also facilitate the assessment of results through peer review. In addition to detailed procedures and lists of required equipment and instruments, protocols often include information on safety precautions, the calculation of results and reporting standards, including statistical analysis and rules for predefining and documenting excluded data to avoid bias. Protocols are employed in a wide range of experimental fields, from social science to quantum mechanics. Written protocols are also employed in manufacturing to ensure consistent quality. A good protocol leaves its user the necessary freedom to act upon encountered results of its steps; it is not intended to provide strict instructions.

A very common categorization of design requirements (Brockmüller, 2008) or project requirements (Wijnen et al., 1995) is the distinction in:

- Boundary conditions: requirements or rules that cannot or may not be altered by the design, and that have to be met unconditionally (e.g. legislation, ethical habits, code of conduct);
- Functional requirements, depicting requirements on the results or performance of the design – i.e. what it is intended to do – the most important requirements;
- User or operational requirements, entailing requirements regarding the use of the design, e.g. maintenance or operating specifications;

- Design restrictions on the preferred solution space by the designer(s);
- Attention points, being those requirements which are relevant to the design and should be considered, but which are not requirements that have to be met, but neither are design restrictions.

## 6.2 Functional requirements for the protocol

Functional requirements are demands on the performance of the protocol that we intend to design: what the protocol is designed to do. Our functional requirements will be based on our previous analysis of the research results and omissions in literature on customer co-creation in innovations (see 1.3) and 3CI Framework.

In our introduction (section 1.3) and review of the theory on co-creation (Chapter 4) we have observed that there is no clear and unambiguous viewpoint on the customer that has to be involved in co-creation. Therefore, the first requirement we can think of is that the protocol has to specify the customers that are to be involved: should they be the existing or potential customers, should they be the end users or the customers that 'pay the bill'. This especially essential in B2B settings, where the customer that decides on the procurement and pays the bill is not necessarily the one that uses it. Or for production chain situations, where each link transforms an unfinished product into a more finished one, but where it isn't necessarily the use of this product. A way of defining the user of the product or service is the value creation perspective, i.e. as customer / user can be considered every person or role in the value network to which the product represents a direct value proposition.

***Design Requirement # 1      The protocol has to specify the type of customer to be involved in co-creation.***

The protocol should also lead to a better input from customers, increase the speed of the innovation process, increase the learning about the customers, and increase adoption chance. However, it will not guarantee success, since this depends on other factors as well.

***Design Requirement # 2      The protocol has to lead to effective and efficient innovation processes.***

Involvement is deliberate, intentional, and not coincidental. The same applies to the innovation project. So, no involvement that comes forth from serendipity.

***Design Requirement # 3      The protocol is intended for situations where the firm intends to premeditatedly involve its customers in co-creation in innovations.***

Flowing forth from our discussion regarding the sectors and industries which are suited for involvement, a next requirement is that the protocol should indicate for which sorts of industries and types of innovations it is applicable, or in which situation which combination of variables is appropriate, making it as robust as possible, that is avoiding too many specific situations. In nowadays industries boundaries between sectors are not clear anymore, firms take part in networked initiatives that develop a combination of novel ideas. The difference between product and service is in many cases also not

obvious anymore. What is used in the industrial sector also becomes more and more available to consumers, think for instance about computers. This means that designing a protocol for only one sector really limits the possibilities and is rather unrealistic. Based on the practice that the process for radical and incremental innovations and the process for new service development and new product development are very similar, and exhibit only minor differences, we will design a protocol that is suited for all sorts of industries or innovation types. When needed we have to give specific directions for sector(s) where the protocol deviates from the generic protocol (de Bono, 1998).

***Design Requirement # 4    The protocol has to be applicable for all sectors, products and innovation types by distinguishing their particular characteristics.***

In principle, all innovation projects may benefit from customer co-creation. However, in all industries or innovation types, the situation can be such, that exceptions exist or arise, making customer co-creation undesirable. So we need to define criteria, which are preferably sector or innovation type independent, with which we can decide whether customer co-creation is (still) suited, given a particular or specific innovation project. The protocol shall therefore give the user means to identify the specific value of customer co-creation in the innovation project as well as potential risks and (examples of) conditions when these have to be given a special attention. This approach will help the user to make his own decision whether in his specific case the value outbalances the risks or vice versa.

***Design Requirement # 5    Criteria have to be given to decide whether a particular given innovation project is suited for customer co-creation or not.***

The protocol must support the decision for co-creating with customers, the identification of customer requirements to participate, the selection, recruiting and preparation of these participating customers, the activities that they can or should conduct, and the way they should be treated and rewarded. It should also help to set practical targets for product or service concept development based on this customer participation. The protocol should be designed to allow the resulting input from the earlier co-creation to be flexibly utilized in the subsequent phases of involvement. As we have elaborated in our research design, we intend to develop a protocol to fill in the omissions encountered in present research. The protocol should tell how to involve and engage customers in an innovation process/project in terms of:

- the requirements (expertise, competences) regarding the customers to involve,
- the activities or process phases to involve them,
- the contributions they can/should make,
- the tools and instruments to support the co-creation.

***Design Requirement # 6    The protocol should tell who to involve (requirement for the participating customer), when (process phase), and how (contributions and tools).***

The protocol should also be applicable for both online and offline situations when that is appropriate. Companies that do not have the opportunities or finances to either one,

should not be inhibited or prohibited to co-create with their customers in innovation. The protocol should tell when and how to do it online or off line or both.

***Design Requirement # 7     The protocol should address both online and offline possibilities, procedures, conditions and tools for co-creation and state where which can be best applied or is most practical.***

The protocol is intended to involve end users of a certain product or service, whether in industrial setting or consumer. Quite often in industrial companies, a rather small part of customers can be distinguished as key customers. Particularly the expertise of these key customers should be exploited carefully and their inputs understood properly, in order to see their inputs as representative for the non-participating customers. For consumer businesses it is often the case that many customers are quite invisible for the company, implying that the individual use of products or services, especially in relation to competitors' products and services are insufficiently known by the company. A customer's inputs, whether a consumer or a business client, can be understood properly only when customer's use context, use environment and use objectives are carefully understood. In order to achieve this, a systematically organized and intensive interaction is needed as an intake. The achievement of the former kind of intensive interaction should be supported at least when assessing the participating customers. When the background for the customer's input is properly understood and documented, the input can be better understood and the changes in needs and requirements more easily predicted. In addition, the protocol should also capture hidden and future needs and try to predict the situation at the moment of a new product's launch.

***Design Requirement # 8     The protocol should provide means to assess customers' suitability, i.e. capability to provide useful input when participating in the innovation project.***

Not every customer can participate unprepared, some have to be taught or trained to participate, others will have to get specific tasking to perform properly, and in other cases we need to get potential participants in a proper creative state. So, we have to elaborate on the ways to prepare the customer for an optimal co-creation.

***Design Requirement # 9     The protocol has to provide directions to prepare the participating customer for an optimal participation.***

## **6.3 User or operational requirements**

The protocol should also be a guideline, not a strict protocol. It is more of a language than a manual. It should give the user freedom to act alternatively, skip steps if deemed necessary, and apply only some of all recommendations in an innovation project. In other words, if the user only wants to involve customers in the testing of a new product, he shouldn't be obligated to perform other co-creating activities as well, like needs assessment, design and development. Similar, if there are activities that are not recommended for customer co-creation by this protocol, the user should make his own decisions on whether to involve customers or not. For instance, we will see that customer co-creation in radical innovations is tricky in the beginning and that the company should use lead users or no users at all. Using firms should have the freedom to divert from this recommendation by involving ordinary users as well.

***Design Requirement # 10     The protocol should provide the user some discretionary freedom in following the prescribed actions.***

The protocol is meant to be used by managers that are in command of an innovation project, e.g. product development managers, marketing managers, and such. This means that the protocol should be used by them, providing them with the necessary knowledge and skills to conduct a proper process, and therefore demanding no particular training or knowledge. If additional skills are deemed necessary, this should be clearly indicated in the protocol, or it should be indicated what alternatives managers have to gain that skill, e.g. by hiring a professional or a facilitator. External aid or support should only be required in exceptional cases, on indication by firm.

***Design Requirement # 11 The protocol is intended for use by the management of the firm that leads and directs the innovation project.***

This protocol should be used continuously and systematically, not only as a starting and single activity in the beginning of a product or service development process. The customer input or involvement should accumulate gradually in the process. The protocol should make this kind of operation possible. In other words, customers' inputs can be re-used in succeeding or other innovation projects, without having to go through the same procedures or activities that have been executed before to acquire them.

***Design Requirement # 12 The protocol should provide a basis for repeated and continued use.***

People applying the protocol should be able to step into a customer's role and listen carefully to the customers. The protocol should support this. In careful listening it is important to take into account and understand customer's background and values, map customer's use problems and opportunities, and to notice unspoken concerns. The protocol should therefore be able to handle systematically input or expertise that is qualitative and even intuitive. A significant part of customer involvement is not very explicit, especially the input concerning trends, future needs and experience. Still, it is very important to exploit this kind of input.

***Design Requirement # 13 The protocol has to provide guidelines or procedures on how to understand, interpret and translate unarticulated, unconsciously expressed, and intuitive customer input from participating customers into product/service input***

The protocol should be able to provide a common language. Different persons in different functions and especially in different companies often use a very different language. This includes also that different people may understand the same terms and words very differently. Communication inside the company and with the customers can be promoted significantly with the right protocol.

***Design Requirement # 14 The protocol should provide rules or guidelines for a common language, with which customers' inputs can be communicated with all relevant representatives from the firm, and between customers and innovation team members.***

One particular requirement is also that, in order to keep resistance to the use of the protocol as low as possible, the impact on existing innovation procedures and organization should be as low as possible. It is preferred to use existing procedures and the standing organization than changing it all by introducing completely new ones.



Companies use different kinds of tools and techniques in different situations, depending e.g. on the objectives, resources and time available for need assessment, product development and commercialization. A too large number of available tools can, however, be confusing when selecting a suitable tool. Companies are not easy adopters of new innovation tools and techniques (Nijssen & Lieshout, 1995).

***Design Requirement # 15    The number and novelty of tools and techniques that are meant to support the customer co-creation should be kept to a minimum.***

A broad and undistorted deployment of the customer input within product development is desired in customer participation: in order to get unbiased information about customer inputs in as useful form as possible, product development itself should participate in applying the protocol in several stages of product development. Close interaction between the representatives of the customer and product development is fruitful in other ways, too: having the experts of both needs and solutions to interact together can effectively facilitate the achievement of innovative results.

***Design Requirement # 16    The protocol tools and techniques should be directed at supporting the direct and close interaction between NPD team members and participating customers.***

## **6.4 Boundary conditions**

Boundary conditions are those conditions that have to be met unconditionally in order for the protocol to work.

One critical, first condition is that the protocol is intended for organizations that wish and intend to involve customers for innovation purposes, not for other purposes, like cross- or deep selling, relationship maintenance, pleasing or surprising the customer.

We also assume an ethical use of customers' participation, i.e. customers should not experience disadvantages or repercussions from their participation.

We also expect that firms respect legislation and codes of conduct, e.g. privacy and IP legislation, respecting, and not humoring participants' lifestyles, behaviors or disabilities.

Another assumption is that the firm is capable of reaching its customers, communicating with them (language and technology), to reward them properly.

The firm has a positive reputation or image: its customers will trust the firm that it will keep its promises and its integrity during and after the engagement.

If the companies wish to emphasize their active role towards customers, supporting the co-operation, trust, mutual understanding and commitment to mutual goals are important. The participating customers should be assessed carefully. In this way, trends and future needs can be predicted more easily and the active role of the company be emphasized in product development.

One last requirement is also that customers remain customers. It is not our intention to make customers fully capable of competing with their suppliers, by empowering in such a way and making them experts so they can replace their suppliers. That is, we do not want to create new entrepreneurs or new employees out of the participating customers, so training has to be kept to only the essential skills.

## 6.5 Design restrictions and attention points

There are still a lot of organizations that think that customer co-creation is just a fad, hype. A recent survey among Dutch marketers exhibited that about 70% of researched companies has never made the step to invite customers in co-creation, half of them state they fear to do so, because the company is not ready for the step, but also because of fear of an assertive and empowered customer (Helkema et al., 2008). Other surveys show that organizations think it is costly to involve customers (Chan & Lee, 2004). And many R&D driven organizations also are reluctant because of IP-breaches or disclosures (Tapscott & Williams, 2007; West & Gallagher, 2006a). Another possible barrier could be that employees, especially new product developers and designers, might consider customers' contribution as ambiguous and overly simplistic (Olson & Bakke, 2001). Needless to say that if such objections to customer co-creation arise, the start of the journey is going to be troublesome. It is not our intention to provide solutions to these problems in this protocol – companies will have to seek for proper assistance from e.g. change consultants. We believe, however, that these barriers have to be eliminated before starting a project involving customers, implying an organizational change or transition in both technical and social architecture<sup>22</sup>, which will lead to a new organizational design (Pitta & Franzak, 1996; Prahalad & Krishnan, 2008; Yoo et al., 2006). Alam (2006a) states that firms that want to involve their customers in innovations, need to adapt their strategy for this phenomenon. This strategy adaptation implies several aspects concerning the handling of intellectual property rights, neutralizing an inherent 'not invented here' attitude with design and development employees (Olson & Bakke, 2001), breaking monopolistic policies with the marketing department regarding the exposure of firm employees towards customers, and such. Such issues imply organizational and system changes (Tidd & Hull, 2003) that we will not prescribe in our protocol. Wherever appropriate and necessary, however, we will indicate where such changes are needed or come in handy, and will refer the user towards more elaborated literature on these topics. A practical guide for initiating and maintaining such internal changes, adaptations or developments can be found in John Winsor's book *Spark* (2006). A more systematic and structured approach in guiding the transition is given by Prahalad and Krishnan (2008) in their latest book *The New Age of Innovation*.

Companies should stay in control of the process, meaning that we are not creating a protocol to make customers 'the boss' in what and where companies should innovate. This implies that the initiation and decision power is and remains with the company. Of course, companies can still source innovations where users have been the initiator, but the protocol will neglect these developments, or the company has to take over the initiative, e.g. by buying the idea or concept from the customer.

Gault and von Hippel (2009) found in their study that a large part of user-innovators surveyed transferred their innovations to other users and/or equipment suppliers at no charge at all to recipients. Since cost-free sharing of innovations is understood to result in greater social welfare than licensing for a fee, authors suggest to re-examine IPR policies. IP-legislation can differ per country, and firms also use discretionary criteria on when to apply or not to apply IP-legislation. Since the subject requires a thorough knowledge on laws, the protocol will not address intellectual property (IP) procedures on how companies can protect, buy, or bypass these. The protocol respects that IP can be an issue in the customer-company relation, but assumes that customers are willing to

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<sup>22</sup> Social architecture is defined as "the sum of the systems, processes, beliefs, and values that determine an individual's behaviors, perspectives, and skills in an organization. It includes managerial behavior determinants such as organization structure, performance metrics, reward systems, career management, training, beliefs, and values" (Prahalad & Krishnan, 2008:148).

abdicate these rights or come to an agreement with the firm concerning the sharing of fees and royalties, resulting from patenting or licensing (Foxall, 1988). Research that has been conducted on consumers participating in online communities demonstrates that most co-creators recognize that the brand – not they – will own the resulting IP (Bughin et al., 2008).

## **6.6 Conclusion to this chapter**

We have now reached a point where the design and development of the intended 3CI-protocol can be initiated. We have reviewed literature explaining the benefits, conditions and (modes of) interventions which are manifest in CI situations (3.5). We have also reviewed some practical cases where CI in innovations, new product and new service development was applied (Chapter 5). Based on these reviews we have been able to formulate a set of design requirements for the intended protocol. We are now able to proceed with the development of our design propositions in CIMO-logic.

# Chapter 7 Design propositions regarding the context of involvement

## 7.1 Introduction to this and next chapters

In Section 4.4 we have introduced the concept of *Customer Co-Creation in Innovations*, which covers the idea of customers becoming actively involved in a firm's innovation process. We have seen that involving customers can be very beneficial for both customers and the firm, in terms of innovation quality, efficiency, speed, and diffusion, but also in respect to customer loyalty and satisfaction (sub-section 4.4.3). Based on these insights regarding the benefits, we defined in section 4.13 the construct of *customer co-creation in innovations* as the process where product manufacturers and/or service providers engage with and involve their end users or customers in (parts or phases of) innovation projects with the aim of increasing effectiveness and efficiency of the innovation process. Effectiveness refers to (1) the result of meeting users' and customers' needs and demands in a better way; and (2) increasing customer loyalty. Efficiency refers to (1) the reduction of research and development costs; and (2) the reduction of development time. It was, however, also discussed that radical and disruptive innovations seem to be less suited for customer co-creation (see sub-section 4.4.4), unless some methods to get access to tacit customer knowledge are applied. We therefore become aware of the fact that customer co-creation might not always be appropriate, or subjected to one or more conditions that have to be fulfilled, in order to be able to reap its fruits. These conditions have to be reflected in our final design.

Based on the preceding reviews on modes of customer co-creation and some practices in this field, we can now proceed with the design of our protocol for this co-creation. Our intention is to design a protocol in which firms can actively engage their customers to participate in a NPD or NSD project. Although customer involvement has long been an aspect of NPD by means of market research, pretesting, conjoint analysis, and such, we will not direct our attention to those kinds of involvement because of the passive, reactive and aggregate nature of such an involvement. We classify these approaches as passive and reactive in the sense that participating customers are usually not aware of their participation – they cooperate in a survey or questionnaire, without knowing or being aware that their input is being used for a specific NPD-project. They are aggregate in the sense that individual opinions, ideas, and so on do not matter to the firm – it is the *average* or aggregate and typically quantitative input which is used to determine customer needs, requirements and beliefs. Our aim is to design for customer co-creation, which is of an active, individual, qualitative, and voluntary nature (see also section 4.13). Participation refers to activities that may be formal or informal, direct or indirect, active or passive, performed alone or with others, and that occur overall in or at specific stages of the innovation process (Barki & Hartwick, 1994).

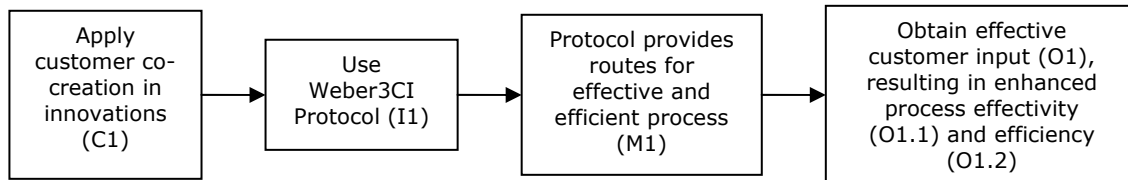
In this chapter and the next 2 chapters we will develop the necessary design propositions for the protocol. We will refer to the protocol as the 3CI-protocol: the *Customer co-creation in innovations* Protocol. Our approach in developing the propositions is to depart from our design requirements, articulated in Chapter 6, our 3CI framework of aspects and attributes of customer co-creation – see 4.13 – and to review the available literature on customer co-creation in innovations systematically with these requirements and the framework as a foundation to formulate the design propositions. In this approach we encountered that existing 3CI literature is in itself insufficient in its description, elaboration and explanation of the underlying mechanisms for the interventions to be proposed. Because we want to make our propositions in CIMO-logic, in which the generative mechanisms of the outcomes of certain interventions are also explicated, it

was necessary to expand the literature review with studies of theory describing, explaining and elaborating such mechanisms. This supplemental review was found in the (social) psychology, sociology, and organizational science literature.

A first and overall Design Proposition for this 3CI-protocol may already be proposed:

**Design Proposition # 1** *Companies that are willing to and looking for proper ways to co-create with their customers in the innovation process (C1) can apply the 3CI-protocol (I1), because this protocol provides the appropriate routes and actions (M1) that lead to an effective input from customers (O1), needed to enhance the effectiveness (O1.1) and efficiency of the innovation process (O1.2). Process effectiveness is enhanced because (1) the innovation outcome is a product or service that is what customers want; (2) the innovation will be adopted quicker than without involvement; and, (3) being involved make customers more loyal to the firm. Efficiency is enhanced, because (1) R&D costs will decrease; and (2) innovation development speed increases.*

In a schematic diagram:



**Figure 7-1: Schematic diagram of design proposition #1**

In order to develop the underlying propositions, we will look at both theory and practice on aspects and elements that constitute the protocol. These aspects and elements are (see also section 4.13):

1. *Context* of involvement, entailing:

- The *nature of the firm, its markets and economic and technological environment* that determine whether and to what extent a firm can co-create with its customers in innovations. Here we can make distinction between product and service providers, the market type (B2B, B2C) and maturity, the type of industry and eventually not-for-profit situations.
- The *source of the innovation*, distinguishing between customer initiated ideas and company initiated ideas, indicating whether the company should look for individual contributions from single customers or collective contributions from communities.
- The *type of innovation* where customer co-creation is required or appreciated. Here we can make a distinction between product/service/process innovations (object of innovation), radical and incremental innovations (novelty), and the openness (extent of disclosure to external parties).

2. Factors regarding the *customer* which is involved, consisting of:

- The type of customer, where customers can be users, end users, existing customers, potential customers (new markets) or arbitrary individuals in this universe.

- The *expertise or competence of the customer*, necessary for an effective and efficient co-creation. An aspect that also has to be considered is the proper amount of participants to involve.
- The *engagement of the customer into participation* by looking at the involvement, the influence, motivation and commitment required from the customers that participate, which depend on the perceived benefits of participating.

### 3. Aspects regarding the *process* of co-creation:

- The *timing* of the co-creation, i.e. the stages and activities of the innovation process, in which customer input is appropriate.
- The *roles and contributions* of the participating customers: which activities do they perform and conduct.
- The *mode and intensity of interactions and communication*: which communication channels are suited for co-creation, who communicates with the customers and how intense does this communication has to be.
- The *techniques and tools to support* customer co-creation: which already used tools and techniques can be deployed, and which additional techniques have to be acquired and used.

We will take a closer look at all these perspectives, thereby reviewing relevant theory and practice on customer co-creation, and translating them into design propositions for our protocol. Design Propositions will be formulated as a set of sentences containing the four necessary components of the CIMO-logic, whereas C stands for context, I for (the set of) intervention(s), M for the generative mechanisms, and O for the expected outcomes. Design propositions will be numbered in sequence of development, while the CIMO elements will be similarly numbered, e.g. M2.3 for the 3rd mechanism in the 2nd proposition. Each proposition will be modeled by a causal diagram, depicting the relation between the individual components of the proposition. At the end of the chapters we present an integrated and cumulative diagram for all propositions which have passed the development stage.

## 7.2 The nature of the firm and its market(s)

### 7.2.1 Strategy orientation of the firm

In section 2.8 we discussed whether it is necessary for firms to pursue a market/customer oriented strategy or a technology/innovation oriented strategy in order to create successful innovations. We have seen that both strategies are to be pursued, since a mere market orientation could lead to the obliteration of potential new markets. On the other hand, a technology orientation typically disregards market needs and customer wants, at least in the start of the new technological development process.

A market focus involves orienting the activities of the business to satisfy customer needs and wants. The concept of the customer oriented organization has as its roots the development of the marketing concept within both the marketing and management literatures. The marketing concept is essentially a business philosophy or a policy statement which suggests that the long term purpose of the firm is to satisfy customer needs for the purpose of maximizing corporate profits (Kohli & Jaworski, 1990; Webster, 1988). In the popular press, Peters and Waterman (1982) suggest that being "close to the customer" is a key distinguishing feature of the best of American enterprise. Excellent

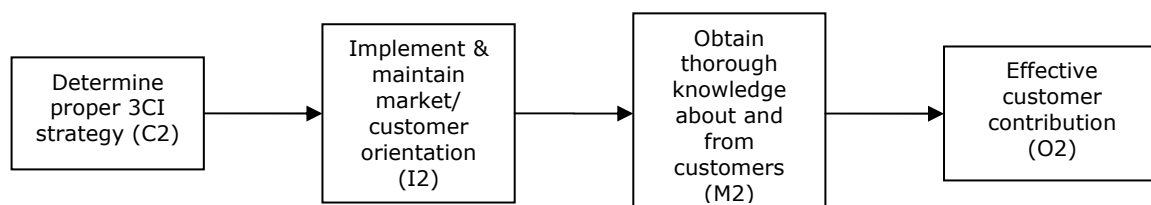
companies in their study were characterized as being obsessed with quality and service, practicing nichemanship (which uses tailored products and services to fit specific consumer segments), and actively listening to customers. Specifically, Ruekert (1992) defines the level of market orientation in a business unit as the degree to which the business unit: (1) obtains and uses information from customers; (2) develops a strategy which will meet customer needs; and (3) implements that strategy by being responsive to customers needs and wants. On the level of business units the degree of market orientation may vary between business units of the same corporation. Involving customers in the company's processes thus typically fits in a market orientation (see subsection 4.4.1) – and more specifically – requiring interaction with (potential) customers in order to obtain the necessary knowledge from customers (Davenport et al., 2001; Gibbert et al., 2002; Olson et al., 2008; Ruekert, 1992).

We finally refer to the case of Douwe Egberts Coffee Systems, where customer involvement in the innovation project was an indisputable element of the market orientation strategy the company was implementing, demonstrating that market orientation serves as a condition to co-create with customers in innovations.

This leads to a next design proposition for our protocol:

**Design Proposition # 2** *In determining the proper innovation strategy for co-creating with customers in the innovation process (C2) companies should implement and maintain a market orientation, in particular a customer orientation (I2), because such an orientation aims at obtaining a deep understanding and increasing the knowledge about and from the customer (M2) that can lead to an effective contribution of customers (O2).*

In a schematic diagram:



**Figure 7-2: Schematic diagram of Design Proposition # 2**

### Implementing and maintaining a market orientation

Narver and Slater (1990) suggest that the market orientation of an organization involves three behavioral components (customer orientation, competitor orientation and inter-functional coordination), and two decision criteria – long term focus and profitability. All research that has been done on the implementation of a market orientation has served to extend the concept of market orientation from being purely a business philosophy to representing the actions an organization pursues in relation to the marketplace. Several common characteristics are shared by these contributions including: (1) a market orientation results in actions by individuals toward the markets they serve, (2) such actions are guided by information obtained by the marketplace, and (3) such actions cut across functional and divisional boundaries within the organization.

A dominant view of organizational functioning suggests that organizational actions such as the degree of market orientation are inextricably linked to the organizational structures, systems and processes created to sustain them. For example, to properly

control the knowledge traffic from outside the organization, moving boundaries, e.g. multi-functional units, may be a remedy (den Hertog & Huizenga, 2000). While structural aspects of the organization may serve to foster or inhibit a market orientation, the existing literature has tended to focus on the processes used by an organization to accomplish organizational goals. This line of reasoning has been proposed by Kohli and Jaworski (1990), who suggest that organizational processes such as the manner by which employees are compensated and rewarded serve as antecedents to developing a market orientation. These organizational processes can either serve to enhance this development or be a roadblock which prevents such development. Three organizational systems of interest are the recruiting and selection system of personnel employed to carry out the strategic mission, the training system designed to provide employees with the skills necessary to carry out their specific tasks, and the reward and compensation system which serves to direct behavior toward the accomplishment of the business unit's goals and objectives (Kelley, 1992; Ruekert, 1992). Certain types of individuals may be more or less prepared to carry out their job responsibilities with a strong sense of customer focus. Prior experience both in terms of education and work experience may permit one individual to assume more of a market orientation than another. Similarly, the training system can also serve to support a market oriented strategy. The desire to improve customer service often requires increasing employee sensitivity to customer needs and is often accomplished through formal employee development programs. In developing a market orientation, compensation and rewards can serve to reinforce the importance of satisfying customer needs and direct individual behaviors toward this goal. For example, compensation systems for production employees based on cost control is relatively less customer oriented than a compensation system designed to reward zero product defects. At the individual level, a strong market focus can provide a number of psychological and social benefits to employees (Ruekert, 1992). For example, managers in Kohli and Jaworski's (1990) study noted that a market orientation leads to a sense of pride in belonging to an organization in which all departments and individuals work toward a common goal of serving customers. They conclude by proposing that the level of market orientation is positively related to the esprit de corps, job satisfaction, and organizational commitment of employees.

Ruekert (1992) examines the presence of market orientation in a large corporation with several business units and thus identifies the most important aspects in the development and implementation of a market orientation. He tested 23 items among business unit managers; the 23 items produced a very wide range of agreement from this sample of managers. The item which produced the highest level of agreement was the statement that management listens to the opinions of customers, to which 81 percent of the sample agreed. On the other extreme, only five percent of respondents agreed that the company invests in building market position for its products. Overall, the use of market information items as well as the implementation of market oriented strategy items generally produced higher levels of agreement than the items used to capture the development of a market oriented strategy. It could be argued that this reflects the necessity for interacting with customers either in terms of information or in the delivery of customer satisfaction, whereas the development of a formal strategy tends to reflect an internal decision making process, in which alternative viewpoints also compete for management attention and support. For top management, Ruekert's study implies that the challenge of improving the market focus of the firm must be approached at the business level with the role of corporate structures and processes facilitating such an organizational transition. Corporate management may be well advised to conduct assessments of the current degree of market orientation across business units using an approach similar to this study in order to develop the diagnostic information needed to generate corporate level initiatives designed to improve the customer responsiveness at the business unit level. Interestingly, the factors which provided the next highest amount of differentiation between the highest scoring and lowest scoring businesses on the degree of market



orientation were the organizational support processes of recruiting customer oriented personnel and the reward and compensation policies used to motivate and control business unit employees. Thus, the institutionalization of the value of customer sovereignty, through organizational processes, may be as important as the specific planning practices used by the business unit. Taken as a whole the findings suggest that the market oriented firm tends to possess a gestalt where different aspects of organizational behavior tend to fit together to provide superior customer responsiveness. One implication for managers interested in developing a market orientation is that changing a single element within this gestalt may have little impact on the organization (Ruekert, 1992).

We therefore conclude this expose on the implementation of a market orientation in a firm with the proposition that the adoption of a market orientation is an *organizational design* activity that entails strategy, structure, systems, processes and staff recruitment and training (Kelley, 1992; Kohli & Jaworski, 1990; Ruekert, 1992), focused on (1) obtaining and using information from customers; (2) developing a strategy which will meet customer needs; and (3) implementing that strategy by being responsive to customers needs and wants. This conforms to our design proposition that for an effective customer co-creation, a market orientation is imperative, because it provides the effective means to listen to and communicate with customers.

### **Tools and techniques to support the implementation and maintenance of a customer orientation for innovation purposes**

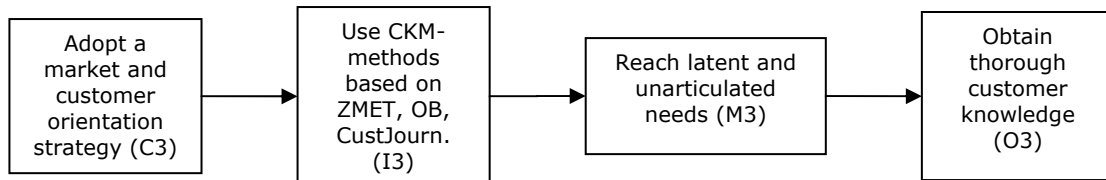
The design proposition assumes that customer knowledge can be easily obtained. Davenport et al. (2006) propose to apply Customer Knowledge Management (CKM) using one or more of the 5 styles of CKM, which are distinctively different practices, but not mutually exclusive (Gibbert et al., 2002). However, several studies (Un et al., 2010; von Hippel, 1994) show that knowledge needed from the customer can be difficult to access, reducing the chance for success when involving customers. In order to truly understand the customers, company managers must immerse themselves in the lives of their customers (Hunt, 2009; Winsor, 2006). Other studies teach us that radical and disruptive innovations do not lend themselves to involve the customer from the beginning, because of the fact that customers can't be knowledgeable about things that do not yet exist (Callahan & Lasry, 2004; Christensen & Bower, 1996), unless companies can find a means to access customers' tacit and latent knowledge or sticky information (Piller & Walcher, 2006; von Hippel, 2001b). It is not an easy task to depict when customers' knowledge is easy or difficult to access – even Un et al. (2010) remark that this variable cannot be measured in a direct way, and postulate that it is determined by several factors, like the acquisition costs, the difficulty of identifying the customers, IP-sensitivity, speed of access, and such.

In Appendix E we discuss CKM and its underlying techniques to access and assess customer knowledge. It is argued that access and assessment can be reached with special techniques that go beyond traditional market research. Based on these findings we propose to assess and customer knowledge with customer interviews, based on metaphors and analogies - using the Zaltman Metaphor Elicitation Technique (ZMET™), see Zaltman 2003 – and outcome based principles – see Ulwick 2005. A technique to synthesize both knowledge acquisition approaches can be found in the customer journey approach (Voss & Zomerdijs, 2007). For online application the proposed tools can be integrated in netnographic methods (Kozinets, 1999). In several cases we have presented from practice – e.g. CCCL and DECS, really novel and radical innovations have been developed due to the use of such CKM methods.

We therefore propose:

**Design Proposition # 3** To support the development and maintenance of a customer orientation (**C3**), companies have to apply customer listening techniques, also known as Customer Knowledge Management (**I3**), such as ZMET™, outcome based methods and customer journeys, to properly understand customer needs and wants (**O3**), since these techniques go beyond traditional market research techniques and elicit latent and unarticulated needs and wants of customers (**M3**).

Schematic:



**Figure 7-3 : CIMO-diagram for Design Proposition # 3**

### **7.2.2 Industry the firm operates in**

When inspecting the cases (Chapter 5 and Appendix D) and other examples that have been given during our review on modes of involvement (3.5), we can observe organizations from diverse sectors and industries involving customers or external persons in new product or service development. Whether it is the industrial (B2B) sector or the consumption sector (B2C), fast moving consumer goods (FMCG), high-tech products, services, or the public sector - it does not seem to matter. Organizations in all sectors show modes of engaging customers, clients, users, or civilians to collaborate with them in value creation. In the new competitive arena of one customer at a time and global networks of resources, B2B and B2C definitions even seem to converge (Prahalad & Krishnan, 2008). Athaide and Stump (1999) show in their study that the choice of a particular approach to involve customers in the NPD process is more a function of targeting and product strategies, rather than industry type.

As for new service developments, customer co-creation has received less attention, as observed by recent academic studies (Alam, 2002; Alam & Perry, 2002; Edvardsson et al., 2006; Gustafsson et al., 1999; Martin et al., 1999; Sandén, 2007), implying either a lesser occurrence of this phenomenon in service innovation than in product innovation, or an implicit assumption that customers already co-create services because of their participation in the production process of services (Saco & Goncalves, 2008). Whatever the real reason, customer co-creation is not a privilege for product innovations. And both business customers (Alam, 2002; 2006a) and consumers (Magnusson, 2003; Magnusson et al., 2003; Matthing et al., 2004) have proven to be susceptible to customer co-creation in new service development.

And, as for governmental products and services, involvement of citizens in their development is becoming more and more common (Creighton, 1994; Sanoff, 2000). Even public organizations have succumbed in the act of customer or user involvement in the innovation of new public services (Brand, 2005; Lundkvist & Yakhlef, 2004; Sanoff, 2005). Nevertheless, similar to NSD, research finds it surprising to find little evidence of stakeholder involvement in evaluative design of e-government projects (Grimsley et al., 2007). The role of citizens in policy and infrastructure design processes is mostly confined to commenting or voting on preconceived drafts. Citizens are, in other words, often consulted after the arrow has left the bow. Thus, an important chance for radical innovations is thrown away and the search process remains in a symptom-cure mode.

Nevertheless, genuine participation, even at a late phase, can still trigger substantial incremental innovations in governmental or non-profit settings (Brand, 2005).

Typically, we can see that customer involvement has been a kind of tradition in industrial technology settings, like defense, air and space technology, machine tools and equipment, business IT and software development, and such (see Appendix D). Involvement in industrial settings has therefore been an item of attention in several academic studies (Brown & Eisenhardt, 1995; Gardiner & Rothwell, 1985; Rothwell, 1986; von Hippel, 1976; von Hippel, 1977). Involvement of consumers, in contrast, has been limited for a long time to market research participation in its most passive form, until recent developments in information technology (Prahalad & Ramaswamy, 2003) enable the emergence of participation modes like crowdsourcing and user generated content (Li & Bernoff, 2008). But, strictly speaking, consumers have been co-creating for a longer time, mainly in marketing campaigns, e.g. "Complete this slogan ...", "Find a name for this new product ...". Regardless of whether they are consumer products or industrial products, manufacturers normally benefit from customers' joint innovation in the area of product design (Chan & Lee, 2004). As Prahalad and Ramaswamy put it:

"To see and take advantage of these opportunities, we must suspend the traditional distinction between B2B and B2C customers. In the world of co-creation, we have to imagine every individual who interacts with the company as a "consumer," whether that individual is a forklift operator, a pilot, a design engineer, a beautician, a clinical researcher, an instructor, a contractor, a paralegal or a civic worker. This perspective forces us to discard the artificial distinctions among enterprises and households. Furthermore, historically we have started with "B"—our business—and not the individual consumer. This company-centric view of value creation is deep-rooted, as it has been the very foundation of competition in the industrial era (Prahalad & Ramaswamy, 2003:x)".

Sector, industry or type of offering seems in this respect irrelevant, but that does not imply that an organization can sit back and wait for its customers to contribute in NPD or NSD, neither to suffice with placing a call for participation and expecting customers to participate just because they feel empowered (Boswijk et al., 2005). Etgar (2008) proposes that, in order to achieve effective customer co-creation, the related product or service has to be customizable and important to customers, because these motivate participation. Arakji and Lang (2007) posit some limitations to the involvement of users in the creation of, for instance, digital music, video and games. They reason that technological toolkits are only helpful for products such as video-games that are distinguished by their heterogeneous and rapidly evolving consumer demands (von Hippel & Katz, 2002). When consumers have stable and comparable tastes, the firm can mass produce its product to benefit from economies of scale, without need for innovation toolkits that allow personalized product development. Furthermore, even if the toolkits are relatively easy to use, consumers must have a significant desire for personalized products for them to have enough incentive to dedicate the time and effort needed for the innovation process. Products or services that are of little interest and very commoditized may pose difficulties in interesting customers to participate (Smit, 2006). Customers need to see benefits to themselves in order to participate. In this respect, modern companies that have evolved from commodities to services and experience offerings (Boswijk et al., 2005; Pine & Gilmore, 1999) have reached a level on which this does not pose a problem, as exemplified by the Douwe Egberts (a coffee producer) and LEGO (manufacturer of the toy bricks) cases in Chapter 5. This brings us to another aspect: the market characteristics.

### ***7.2.3 Nature of the economic order and market***

Etgar (2008) asserts that certain macro environmental pre-conditions have to be met, in order to effectively engage consumers in the co-creation process. We will discuss them briefly. A first condition is the firm and its customers are part of, what is called, a mature

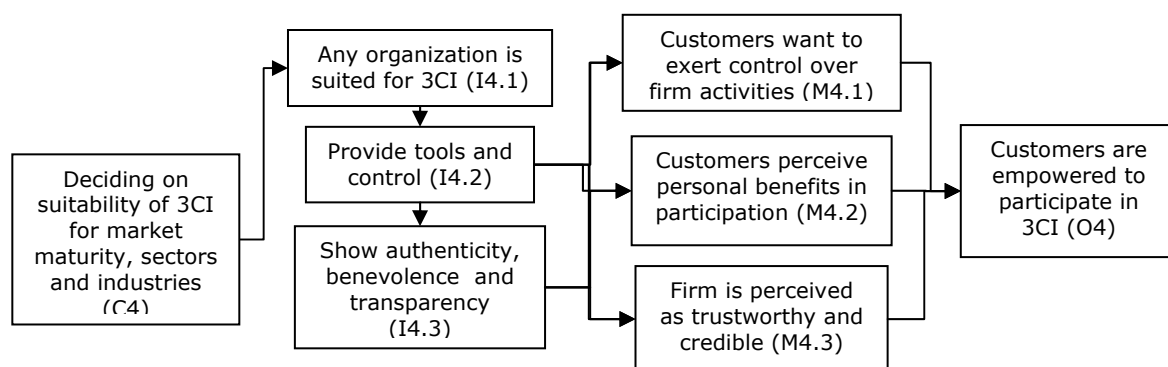
market. Co-creation takes place mainly in mature economies and not in emerging or in growth markets (Johansson, 2006). A second precondition proposes that consumers use a variety of operand resources (material objects or factors on which they can operate) and operant resources (competencies or technologies which they can use) (Vargo & Lusch, 2004), each linked to a cultural schema that helps consumers to enact their social life (Arnould et al., 2006). This converges with the increased demand for experiences (Florida, 2002; Pine & Gilmore, 1999; Prahalad & Krishnan, 2008) rather than for products as major avenues for satisfaction, as we can observe in contemporary western societies. These two conditions are contradicted by Prahalad and Krishnan (2008), who state that even in emerging markets and among very poor consumers, the need for differentiated and personalized experiences is quite pronounced, demanding co-creation. Furthermore, there is a growing recognition that creativity is an important way to generate personal satisfaction (Florida, 2002; Hirschman, 1980). And, finally, interactions from customers with their providers is no longer of a single exchange transaction type, but of a relationship type of exchange over time (Cannon & Perreault Jr., 1999; Gronroos, 1990). In general, customers will tend to participate only when the nature of customer-firm interactions and the behavior of the firm facilitate such cooperation (Etgar, 2008). One major factor is the extent of management's belief in the advantages of such relationships with its customers (Venkatraman & Subramaniam, 2002) – in our opinion a confirmation of the customer orientation as a condition for customer co-creation. Customers will also tend to engage more when several emotional or psychological preconditions are realized. Social psychological literature shows that messages are more likely to be accepted when the messengers are familiar and credible than when they are not (Kelman, 1961). Several authors (Fombrun & Shanley, 1990; Geyskens et al., 1998; Keh & Xie, 2009; Lewis, 1995; Lusch et al., 1992; Morgan & Hunt, 1994; Tapscott & Williams, 2007; Wang & Fesenmaier, 2003) point out the importance of trust, i.e. the ability of customers to believe (credibility) that the innovating firm will perform the required tasks and activities as promised, and will provide customers with the outcomes when requested (benevolence), although the most closely related firms to a customer aren't necessarily the most trusted ones (Cannon & Perreault Jr., 1999). A third condition refers to the state of technological means for customers to interact with their providers. The presently state of the Internet, with new types of communications such as blog writing, e-distribution, broadcasting and video on demand, offers true interactivity with the customer, customer-specific, situational personalization, and the opportunity for real-time adjustments to a firm's offerings to its customers (Rohrbeck et al., 2010; Rust & Lemon, 2001). Access to and skills in technological communication means, like the Internet, are inherent abilities required from possible participants.

Meeting these environmental preconditions increases the potential for a more direct involvement of the customer in innovation activities. These conditions imply that the propensity to engage in co-creation will be higher in societies with higher levels of economic welfare, general education, and computer linked communications. Several authors (Antorini & Schultz, 2007; Dahan & Hauser, 2002; Hagel & Armstrong, 1997; Li & Bernoff, 2008; Prahalad & Krishnan, 2008; Prahalad & Ramaswamy, 2003) attribute customers' increasing participation to technological developments, especially in information technology, such as the developments on the Internet. These developments enable more people than before to connect and interact with firms, thereby gaining attention for their suggestions, ideas, complaints, and such, that accelerate innovation. Other authors (Fuglsang & Mattsson, 2009; Füller et al., 2007; Jeppesen & Frederiksen, 2004; Nambisan, 2002) propagate that intrinsic and social motives, like recognition, social approval, care for society and being a community member, are more likely explanations for customers to connect with companies – technology is merely an enabler to get connected. The truth may reside in the middle - technology is starting to shift the power of value determination from companies to consumers (Edvardsson et al., 2006), where consumers have always aspired to that power. Companies can no longer act

autonomously—designing products, developing production processes, crafting marketing messages and controlling sales channels—with little or no interference from customers (Arnould et al., 2006). Customers now seek to exercise their influence in every part of the business system. Armed with new tools and dissatisfied with available choices, consumers want to interact with firms and thereby co-create value. The use of interaction as a basis for co-creation is at the crux of our emerging reality (Prahalad & Ramaswamy, 2003). Wind (2008) proposes that a fundamental shift in thinking about the role of customers in firms is needed. This world has led to a new breed of consumers. They expect customization (make it mine), communities (let me be part of it), multiple channels (let me call, click or visit), competitive value (give me more for my money) and choice (give me search and decision tools).

User Innovation theory (see section 4.8) has been influenced by the increasing empowerment of users during the last decade. Von Hippel (1998) expresses the expectancy that an increasingly common pattern of innovation task partitioning in which users are 'empowered' to customize products and services for themselves at user sites will take place in this new millennium. Empowerment is enabled and improved by technological advances in the Internet, especially the latest innovation we all know as Web 2.0. The innovation allows information to be shared and communicated like never before and has today matured to a stage where it has important managerial implications. The empowerment of users has radically transformed the way customer value is created and some organizations are beginning to develop huge business concepts based on this acknowledgement. What web applications like social networks, blogs, wikis, and such, all have in common is that they allow user-to-user communication, value creation, assistance and evaluation – in short, they empower the users. This empowerment has transformed the users' self-perception from a naïve customer buying mediocre products to a user that acquires value from being included and allowed to assist and create. The era of the passive consumer is history. Empowered consumers are increasingly in control, which dramatically changes the role of marketing in firms (Tapscott & Williams, 2007).

**Design Proposition # 4** *In determining whether the firm is suited for 3CI in the context of its industry, market maturity and type (C4), any organization, regardless of the sector it operates in, the type of product it produces (goods, services) and type of market (B2B, B2C) can co-create with its customers in innovations (I4.1), provided that the participants are given sufficient influence, power and tools to make contributions (I4.2) and the firm is authentic and transparent in its appeal (I4.3). Because contemporary users' motivation and attitude to exert control over firm's offerings (M4.1), the perception of receiving personal benefits through participation (M4.2), and the perception of the firm as trustworthy and credible (M4.3) are enabled and catalyzed by modern technological applications and the firm's benevolence, customers are empowered to participate in 3CI effectively (O4).*



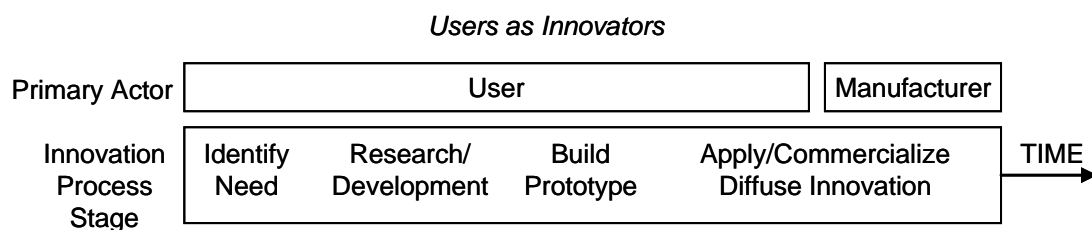
**Figure 7-4: Schematic diagram for Design Proposition #4**

## 7.3 The source of the innovation

The engagement depends on the source or the initiator of the innovation. The initiation of an innovation seems to vary. We observe some modes where the firm takes full initiative to start and complete the innovation, e.g. our cases about CCCL and DECS, whereas there are other modes where the customer takes the initiative to the innovation or re-innovation, e.g. LEGO and P&G cases. In this section we will elaborate on the possibilities in this respect.

### 7.3.1 Customer initiated innovations

We have to realize that ideas for innovations do not necessarily have to be initiated by firms. Customers can play an important role in the initiation of an innovation process or project. Gardiner and Rothwell (1985) emphasize the crucial role of the user in re-innovation, that is, in major and minor improvements in product performance following its first commercial launch. Habermeier (1990) argues that user requirements and product characteristics can often only be discovered if the innovative product or process is actually used, sometimes for a long period of time; usage allows for the refinement and crystallization of actual rather than perceived user needs and product requirements. Early detection and recognition are achieved through proper scanning of the products in use, facilitation of customer feedback on use, and installation of an adequate complaints handling procedure (Griffin & Kordek, 1999) and can be acquired through frequent visits to users, feedback via agents, and planned meetings with critical users (Gardiner & Rothwell, 1985). Modern technology facilitates feedback via various channels, such as blogs, user communities, online forums, etc. with relatively low cost and effort (Bae, 2008; Baker & Green, 2005). Feedback from users through usage may range from the identification of faults, limitations and alternative uses for the innovation, to the design and development of technical solutions to overcome such faults and limitations, improve performance, accommodate for alternative uses and provide additional functionality (Conway, 1993). By establishing an open line to customers, a manufacturer gains access to ideas for new products or even complete designs (Ogawa & Piller, 2006). Even in not-for-profit situations, the citizen-co-innovation process can be facilitated and organized by public bodies such as city governments but it does not have to be so. The case of Brucker Land ([www.bruckerland.info](http://www.bruckerland.info)) is an example of an innovation process that was developed and implemented by citizens alone without any government intervention (Brand, 2005), see Appendix D.



**Figure 7-5: Users as innovators (von Hippel, 1988)**

Customers can also initiate innovations through the modification of existing products – called *modding* (Jeppesen, 2004) or *wrecking* (Leonard, 1999) – , *hacking* (Bae, 2008; Tapscott & Williams, 2007), or user innovations. User innovations as described by von Hippel, are usually initiated by users – von Hippel calls this the User Active Paradigm (von Hippel, 1988). He has found three innovation categories in which it is typically the product user, not the product manufacturer, who recognizes the need, solves the problem through an invention, builds a prototype, and proves the prototype's value in

use. If we apply this finding to 'stages' of the (technical) innovation process, we find that the locus of almost the entire innovation process is centered on the user. As is shown schematically in Figure 7-5, only commercial diffusion is carried out by the manufacturer.

If companies want to play a role in the development of such user innovations or re-innovations, they will have to detect, identify and monitor such user initiatives, and facilitate an early acquisition of the idea or concept; discovering and acquiring such innovations in late stage could lead to user commercialization (Baldwin et al., 2006; Foxall & Tierney, 1984; Hiennerth, 2006; Lettl & Gemünden, 2005; Shah, 2000; Shah & Tripsas, 2004). Fortunately for companies, most user innovators do not tend to commercialize their innovations (von Hippel, 2001a), mostly because of the fact that the motives for user innovators to start innovating are not primarily economic (Shah, 2000) and because high costs associated with the self development and commercialization of the idea (Baldwin et al., 2006). Companies can relieve user innovators from the burden of high investments by purchasing the innovation or innovation rights, or by giving financial support to the user innovator.

### **User or customer communities as the source**

Focus groups and market research have traditionally provided valuable insight for firms looking to improve their operations and products. But online communities are now proving another popular source. Online communities offer a number of opportunities to develop products with customers as well as to create innovations (Pitta & Fowler, 2005). In online firm-hosted user communities users freely reveal innovations to a firm's product platform, which can put the firm in a favorable position (a) because these new product features become available to all users through sharing on a user-to-user basis, or (b) because it allows the firm to pick up the innovations and integrate them in future products and then benefit by selling them to all users (Jeppesen & Frederiksen, 2006). Customer communities seem to create a symbiotic relationship between firms and their customers (Fredberg, 2009). The firms are interested in the communities because they are likely to lead to increased customer attention over the long run, because the ideas from these communities can be used as input in firm R&D, and because the customers co-produce content about the brand/product/service in information channels e content which becomes part of the whole offering to customers. The customers, in turn, experience benefits in the form of learning more about the product/service (cognitive learning benefits), enjoying relationships with others in the community (social integrative benefits), gaining in reputation and status (personal integrative benefits) and being stimulated by the experience of consumption (hedonic benefits) (Nambisan & Baron, 2007). Some digital entertainment firms have exported part or the entire of the innovation process to their digital consumer networks. The latter are online communities of consumers who share similar interests and who take advantage of IT's deep involvement in the phases of new product development to engage in the design, development and even preliminary distribution of new digital products (Arakji & Lang, 2007). Tapscott and Williams (2007) describe how the LEGO company set up a website for the Mindstorms users to design application in community, showing that firms can actually employ communities to their advantage.

The concept and reality of online communities attracted global attention due to the publication of Howard Rheingold's book "The Virtual Community" in the San Francisco Bay Area in 1993. Rheingold (2000) was the first who defined the term virtual community as follows:

"Virtual communities are social aggregations that emerge from the net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace."

Rheingold emphasized in his definition the importance of meaningful relationships. Although the term "virtual community" is used popularly (Rheingold, 2000), the term "virtual" might misleadingly imply that these communities are less "real" than physical communities. To maintain the useful distinction of computer-mediated social gathering, we therefore use the term "online communities" to refer to these web forums (Antikainen & Ahonen, 2007).

A great deal of learning and innovation occur in the informal communities-of-practice focused on simply getting the work done (Brown & Duguid, 1991). These communities exist in various settings and may develop improvements or innovations in products, services, and work practices. Members of communities therefore seem to be particularly suitable for virtual participation in NPD, because of their high product interest and knowledge as well as presence on the Internet (Füller et al., 2006; Kozinets, 1999; McAlexander et al., 2002; Schouten & McAlexander, 1995). Unlike the traditional communities of practice (Wenger, 1998), Open Source Software (OSS) and other user developer communities span organizational rather than functional boundaries to create common knowledge and value (Gibbert et al., 2002). Thus, they are also called communities of creation (Sawhney & Prandelli, 2000) or communities of innovation (Wikström, 1996). Communities of creation reflect expert knowledge of customer groups which interact not only with one company, but importantly also with each other. They consist of groups of people who work together over a longer period of time, have interest in a common topic, and want create and share knowledge. Alike communities of creation, communities of co-design (Franke & Piller, 2003) provide common support in the case of goods which can be finally configured (co-designed) by the customer. Special community features are used to support the individual or collaborative configuration (co-design) process. Involving different customers and breaking down the barriers among users opens several possibilities for improving the individual configuration process. While communities of creation address the creation of a new solution space, communities of co-design use an existing one for the purpose of configuration (of a customized product).

Shah (2003) shows how communities are composed by loosely-affiliated individuals with common interests and among his findings, Shah also explores the user community theory and provides evidence in his PhD thesis that informal structure in the user community enables the creation of valuable information and feedback. Shah further shows how this informal structure in the user communities allows for matching problems between individuals who possess the knowledge and resources to solve these problems. Shah (Shah, 2005) also shows how the user community model "is based upon the open, voluntary, and collaborative efforts of users – a term that describes enthusiasts, tinkerers, amateurs, everyday people, and even firms who derive benefit from a product or service by using it" (p. 340). This is also researched by Jeppesen and Frederiksen (2004), in which they describe the case Propellerheads to show that innovative users have lead user characteristics in this case are most likely to be hobbyists, and further that innovative users generally respond to recognition from the firm. To sum up, it is found that user communities emerge and exist because the users are motivated by needs, empowerment, enjoyment, reputation, and official appreciation. The user communities are composed by users and for users, and they work well enough to create and sustain complex innovations (Franke & Shah, 2003). Finally by having a loosely-affiliated structure individuals with common interests or values are able to create valuable knowledge, feedback and innovations.

Innovation by users tends to be widely distributed rather than concentrated among just a very few very innovative users. As a result, it is important for user-innovators to find ways to combine and leverage their efforts. Users achieve this by engaging in many forms of cooperation. Direct, informal user-to-user cooperation (assisting others to innovate, answering questions, and so on) is common. Organized cooperation is also common, with users joining together in networks and communities that provide useful structures and tools



for their interactions and for the distribution of innovations. Innovation communities can increase the speed and effectiveness with which users and also manufacturers can develop and test and diffuse their innovations. They also can greatly increase the ease with which innovators can build larger systems from inter-linkable modules created by community participants (von Hippel, 2005) (xxvi-xxvii).

Franke and Shah (2003) investigated the contribution of voluntary communities of end-users in innovations for the sporting goods industry, and discovered that a certain part of all communities consisted of user innovators, that spent more time in sporting and community-related activities than other community members. These community innovators felt they played an important role in the community. They showed lead user characteristics, which differentiated them from non-innovators, and were usually members of the community for a longer time than non-innovators. We therefore have to be aware that not all community members are willing to participate or able to make useful contributions. Füller et al. (2006) suggest involving online community members to show lead user characteristics. To find them, they translate the lead user characteristics into netnographic characteristics (Kozinets, 2001;2002): "insiders" and "devotees" resemble lead users, and are therefore suited to contribute in NPD, especially in idea generation, design and engineering stages. According to the authors they can be found through measurement scales for all lead user characteristics, and other innovativeness, creativity, cognitive style, domain-specific knowledge and communication abilities (Amabile, 1993; Hirschman, 1980; Manning et al., 1995; Pallister & Foxall, 1998). Aside from the effort to create and conduct such a measurement, we think that such a way of selecting participants could scare interested community members off. Since community members tend to know each other very well, and know specifically who the innovating members are (Franke & Shah, 2003), firms can use this knowledge to find the right participants. It is found that the innovating members tend to directly offer assistance to other members and are referenced by members to outsiders. So, all we have to do is ask the community who is best suited for the task.

Based on data from three industries, Shah (2007) derives a conceptual model that shows how everyday innovations and social interactions among users can lead to the formation of firms and markets. This model begins with "discovery through use." As users of products and services encounter new needs, wants, or use contexts, they are motivated to seek out solutions. Some users may work alone, but many users seek out like-minded individuals with whom to collaborate, forming an innovation community. These communities are characterized by voluntary participation, the free flow of information, and far less hierarchical control and coordination than seen in firms (Ljungberg, 2000). These characteristics allow for rich feedback and the potential to match problem with individuals who possess the ideas and means to solve them. Due to the varied skills and needs of the individuals involved, user communities are often well-equipped to identify and solve a wide range of product design problems. As innovations are developed, refined, and freely shared within the user community, innovators often receive requests for copies of their innovations from community participants who do not want to build their own copy of the innovation. As innovators (and others) observe the value of the innovation to others and the extent to which there is widespread interest in the innovation, firms are founded.

Many user innovators or 'modders' can be found in user communities (Jeppesen, 2004; Lüthje, 2004; Shah, 2007). After his initial focus on individual or organizational user-innovators, von Hippel also starts to focus more on innovation by user communities where he, based on web-based user communities e.g. open source software communities and extreme sporting equipment communities, concludes that

"what is most exciting is that innovation communities composed of users and for users, communities that according to traditional economic views shouldn't exist, work well enough

to create and sustain complex innovations without *any* manufacturer involvement" (von Hippel, 2001a:86).

Innovation communities consist of individuals or firms interconnected by information transfer links which may involve face-to-face, electronic, or other means of communication. Innovation communities can have users and/or manufacturers as members and contributors. They can flourish when at least some innovate and voluntarily reveal their innovations, and when others find the information revealed to be of interest (Franke & Shah, 2003). Innovation communities are often specialized, serving as collection points and repositories for information related to narrow categories of innovations. For example, there are user communities specializing in particular types of open source software such as Linux. Similarly, there are communities of sports aficionados interested in a specific sport like mountain biking, communities of Adult Fans of LEGO and so on. The similarities between OSS-communities and sports communities are striking, despite the fact that one community produces physical products and is geographically concentrated, while the other produces software and is geographically dispersed (von Hippel, 2001a). Jeppesen (2004) furthermore shows that by "letting the complements drift freely in the community" (p. 18), the total value of a given platform will increase and the platform sales will rise. The manufacturer is thereby able to incorporate the best user developed complements in its commercialized offerings. Companies can learn to relate to support and benefit from innovations developed by users of their products and services.

However, there are also pitfalls to avoid for those companies looking to tap into this source of (online) communities of customer insight. Despite the fact that community members can help companies realize innovations and provide almost unlimited innovative ideas, and act as employees of the company, companies might trap into the dilemma where community users' proposed innovation is inconsistent with companies' operational principles (Tapscott & Williams, 2007). This could pose a serious problem if firms do not react adequately, because once community member(s) break the ranks and a company reacts by trying to restrict the rogue action or member, this might backfire and even be detrimental for the innovation success (Funke & Keinz, 2009; Li & Bernoff, 2008).

Another aspect of community involvement endangering firm's initiatives is that community members tend to share their ideas and innovations freely with each other (Franke & Shah, 2003), creating possible IP-breaches. Revealing information to each other is beneficial for an innovator, because (1) it may induce improvements by others; (2) an advantageous standard might be achieved this way; (3) there are low rivalry conditions; and (4) expectations of reciprocity and reputation effects (Harhoff et al., 2003). Allen (1983) found that many production techniques in the 19<sup>th</sup> century were developed by a process called *collective invention*, wherein an essential feature is the free-revealing of technical information to actual and potential competitors. Von Hippel (von Hippel, 2005) does not totally agree with this, because innovation contributors obtain some private rewards that are not shared equally by free riders – i.e. those who take without contributing, making it more of *private-collective* model of innovation incentives in online communities (von Krogh & Hippel, 2003). Nevertheless, this implies that firms that are very protective about IP had better not make use of communities, because information is bound to be revealed. Sawhney and Prandelli (2000) offer an alternative in the co-ownership of IP. We suffice by stating that IP ownerships has to be seriously considered when involving online communities.

To preserve a semblance of order in an online community, such a community requires a coordinator, as well as screening mechanisms to avoid misleading contributions. It functions like a 'gated' community, where residents move about freely inside the community, but only if they satisfy some pre-specified access rules (Sawhney & Prandelli, 2000). Furthermore, the creation of a community can take a long time; companies have

to devote time and resources to promote the community, establish trust towards members and to encourage new entrants in becoming a member. The company needs to adopt the right customer interaction strategy as an element of the innovation activities (Alam, 2006a).

Despite these challenges, many scholars underline the innovative potential of online communities for consumer products, e.g. Kozinets (2002), McWilliam (2000), Prahalad and Ramaswamy (2003), Sawhney et al. (2003), and Verona et al. (2006).

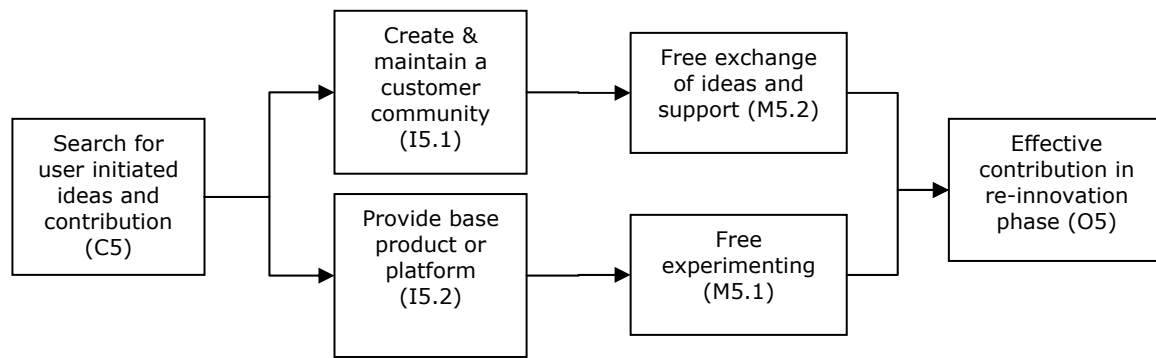
An initial proposition should entail that companies should create and maintain user or customer communities in order to enable user improvement suggestions, ideas, modifications or innovations, which companies can benefit from. However, we may have to realize that by simply creating a community or searching in a community does not automatically lead to users supplying their ideas and innovations to companies. First of all, IP rights arrangements might block users' aspirations to reveal the idea or modification to the firm. Secondly, to modify, alter or hack, users need to dispose of a base product or product platform<sup>23</sup> with which they can experiment their modifications, leveraging ongoing innovations (Jeppesen, 2004; Tapscott & Williams, 2007). Platforms for participation can consist of online toolkits or applications, but can also include products ranging from cell phones, video game consoles to a car – virtually anything that runs software. Thirdly, customers must feel that giving feedback is beneficial in some way. Karau and Williams' (1993) collective-effort model is a type of utility theory that claims that people work hard when they think their effort will help them achieve outcomes they value. Prahalad & Ramaswamy (2000) state that due to the emerging of networks, customers have begun to aggressively generate conversations with manufacturers. These conversations are no longer controlled only one-way by businesses. Each independent customer may discuss with other customers, respond, and learn business related knowledge, and customers may even initiate conversations. The market has become a world where public criticism is common. Customers are gradually stepping out of their traditional role and turning simultaneously into both creators of values and consumers, and becoming competitors of manufacturers in creating values chains (Chan & Lee, 2004). Wind (2008) proposes to create platforms that allow customers to manage their relationships with companies, placing the power even more directly into the hands of end consumers. The focus of marketing needs to augment the traditional solution development with the creation of a set of tools that allow consumers to co-create the right solution. However, research by O'Mahony (2003) shows that contributors to community managed projects have interests and rights over their work, and that they are interested in protecting their intellectual property. The assumption that open source contributors give their work away must be modified in order to account for the ways in which community managed projects protect their work.

Summarized, these conditions have been proposed in Design Proposition # 4, which we can augment with the following proposition:

**Design Proposition # 5**      *When looking for customer-initiated innovation ideas and contributions (C5) the firm has to create, maintain and support a user/customer community (I5.1) in which customers are/have been provided a base product or service (I5.2), with which they can freely experiment to re-innovate (M5.1), and where they can freely exchange and reveal (M5.2) their ideas, suggestions, and modifications to each other and the firm, which they deem necessary and beneficial to themselves, the community and the firm.*

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<sup>23</sup> A product platform is a design, technology or set of subsystems and interfaces shared by one or more product families (Moore et al., 1999).



**Figure 7-6: Design Proposition # 5**

### **Building and maintaining an online community**

The innovation community can be member-initiated or organization sponsored. In many cases communities are not really created by firms but rather discovered and engaged in new ways: organizations decide they want to work with them. Rather than building a community, activity is then more focused on communicating with the community. However, firms can also start the community. For instance, TomTom, KLM, Starbucks, Dell, Microsoft, Samsung and Talpa have established their own community. But companies can also utilize existing innovation communities (Antikainen & Ahonen, 2007), for example InnoCentive, Battle of Concepts, RedesignMe, or Fellowforce (see Appendix D).

It goes beyond the scope of this thesis to provide specific and detailed guidelines to design and build an online community. We refer to the abundant literature and publications on this matter; Kim (2000) is in our opinion a useful and comprehensive source in this respect. We will, however, provide based on these publications some generic design principles for starting an online community for innovation purposes, most of them already addressed in the design propositions, so far.

A survey among more than 140 organizations in building and deploying OLCs in various market-related functions in both B2B and B2C (Beeline Labs et al., 2009) revealed that communities come in different sizes; from less than 100 to more than 10,000 members. The study also showed that communities can increase the revenue per customer, but, more important for our study, increase the product introduction success ratios. In building communities the study revealed as pitfalls: (1) build it and they will come; (2) let's keep it small so it doesn't move the needle; and (3) not invented here. The survey was repeated again in 2009, but on publication of this thesis results were not available yet. Regarding participation in online communities, it has been shown that not all community members participate or contribute actively. Several communities rely for the majority of contributions on only a small percentage of their members (Lakhani & von Hippel, 2003). Although not everyone needs to contribute for a group to be successful (Nonnecke et al., 2006), groups with a large proportion of non-contributors may have difficulty providing needed services to members (Ling et al., 2005). Karau and Williams' (1993) collective-effort model is a type of utility theory that claims that people work hard when they think their effort will help them achieve outcomes they value. The collective effort model identifies conditions under which people will socially loaf less. These include, among others: (a) believing that their effort is important to the group's performance, (b) believing that their contributions to the group are identifiable and unique, and (c) liking the group they are working with.

### ***Provide goal, objectives and context***

Define and articulate the purpose of the community (Hagel & Armstrong, 1997; Kim, 2000; Preece, 2000), but also of the requested involvement (op den Kamp, 2009), by understanding participants' needs and goals, and matching them with the innovation goals and purpose. In this respect, it is important to tell the *back story* of the purpose, preferably through storytelling (Abma, 2003; Brown & Duguid, 1991), using metaphors and symbols. The purpose of the innovation community is to collaboratively create products. These communities are mainly based upon shared enthusiasm and knowledge concerning specific product domains and are often virtual meeting places for innovative users to discuss opportunities and ideas for new products and their improvement (Füller et al., 2004). Manage customer expectations by high transparency (role, process and outcome transparency) (Nambisan & Nambisan, 2008).

### ***Maintain a dialogue***

Create and maintain feedback loops (Kim, 2000; Verona et al., 2006) in order to increase participation and motivation; give participants recognition on their contributions (Jeppesen & Frederiksen, 2006). Innovative users' motivation for participation and innovation in the community are related to a wish to be recognized by the firm hosting the user community. Users generally honor the product, the firm and its developers. Innovative users may therefore feel proud when the firm acknowledges their innovative work openly in the community and perceive this recognition as an additional benefit of creating an innovation. Design to encourage customer innovation with: rating systems, product knowledge centers, social translucence (provide better social cues), customer recognition programs (titles, awards), exclusive customer forums, clean technical designs (simple to use), flow technologies (Nambisan & Nambisan, 2008), and a post moderation approach (op den Kamp, 2009). Post moderation means that the users can view their content immediately and that content if necessary is moderated afterward. By employing this approach, the users feel that their submitted content is recognized by the company. People will not continue to visit a community if they do not find high quality information there; they will not continue to contribute if they perceive that there is no value in the interaction; they will not continue to volunteer if the rewards for so doing are not relevant to their motivations for participation. Participation rewards need not have economic value, but can also stem from the fulfillment of the participants' needs for affiliation, identity, self-efficacy and interaction. Intangible rewards for participation in the community can have a more lasting impact than tangible rewards (Moon & Sproull, 2001).

### ***Member to member communication***

Facilitate customer to customer interaction (Fredberg, 2009; Kim, 2000), like the handling of customer service inquiries and policing of the code of conduct – installed in order to avoid inappropriate behavior or members being mean to another (Del Rey, 2008). In order to achieve this, 'places' and events for communicating with another have to be created, such as message boards, mailing lists, chat facilities, virtual worlds, and social networks (Farooq et al., 2007), and events like meetings, performances, competitions (Kim, 2000), and *brand fests* (Arnould et al., 2006; McAlexander et al., 2002). Places provide the ecosystems that harness human creativity and turn it into economic value (Florida, 2002). Embedding rituals in and around these places and events, such as a customer recognition program keeps the community alive, active and loyal to the brand (McAlexander et al., 2002; Nambisan & Nambisan, 2008). Metaphors are recommended to name these places, events and rituals (Kim, 2000). Allowing participants to comment on each other's contribution is said to be best to maximize the potential of communities (Wunsch-Vincent & Vickery, 2007). Members of a community tend to feel a moral responsibility toward peers in their community, a responsibility to help them in more effective use of the product or service around which the community

has formed, similar to organizational citizenship behavior exhibited by members of an organization who feel that it is their responsibility to provide technical assistance to others within the organization (Moon & Sproull, 2001).

### ***Distinguish members' roles and contributions***

Design for a range of roles (Kim, 2000), allow evolution in contribution (Fredberg, 2009). People aren't the most active at the start of their community membership. They have to gain experience and be motivated (Li & Bernoff, 2008). Accordingly, managers and community moderators need to think about how they can motivate users not only to make contributions to the community, but also to identify key players and to create incentives for users to stay and keep on contributing (Jeppesen & Laursen, 2009).

### ***Keep track of identities and contributions***

Foster trust in the community by creating meaningful and evolving – to capture the change in roles and participants' achievements – profiles for each participant (Kim, 2000). Also create and encourage appropriate behavior or etiquette (Butler et al., 2002), to sustain this trust. Provide context, promote accountability, and keep track of achievements, contributions and awards to visualize one's reputation (Moon & Sproull, 2001). As has been elaborated, reputation is an important cue for trust. But keeping track of participants also helps to recognize one's use experience, an important premise for involvement in innovations.

### ***Educate members***

Train participants in how to contribute, when to contribute and the code of conduct. Make explicit what policies are regarding IP (Nambisan & Nambisan, 2008). This training can be provided through other participants who are more experienced (Kim, 2000), in such a way that newcomers can see this; this will increase activity and participation by regular members (Bishop, 2007).

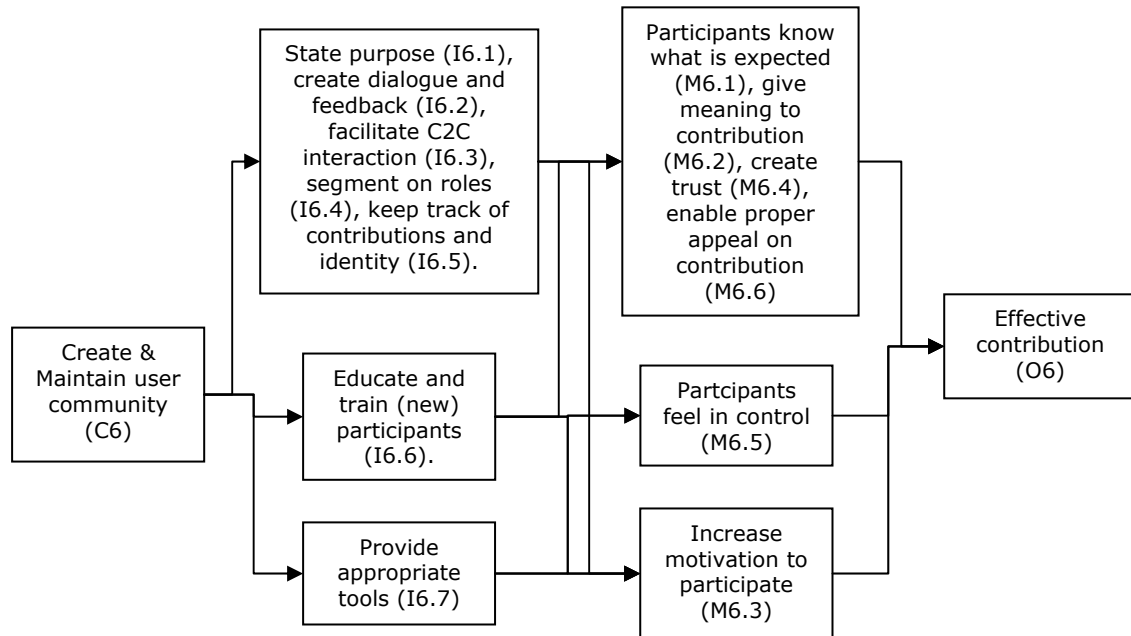
### ***Make tools available***

Users can become part of the design team as an 'expert of their experiences', but in order for them to take on this role, they must be given appropriate tools for expressing themselves (Sanders & Stappers, 2008). Designers should, aside from playing a role in the co-design team with customers, make tools available for non-designers to use in expressing themselves creatively. Online application, however, requires the build of a toolkit that meets specific demands (von Hippel, 2001b; von Hippel & Katz, 2002). So, the firm has to provide proper tools to enable contributions (Hagel & Armstrong, 1997; Zhang & Watts, 2008). People must tend the tools themselves by managing software versions, keeping address files up to date, and so on (Butler et al., 2002).

We translate these in the following proposition:

***Design Proposition # 6*** *In creating and maintaining (online) innovation communities (C6) firms should consider design principles as giving and communicating purpose (I6.1), creating a dialogue through feedback and acknowledgement on contributions (I6.2), facilitating and encouraging customer-to-customer interaction (I6.3), distinguishing different and evolving roles (I6.4), keeping track of customer identities and contributions (I6.5), educating new participants (I6.6), and providing appropriate tools for contributions (I6.7) to achieve an active and productive community contribution (O6). These interventions (I6.1 – I6.7) in conjunction make transparent to participants what is expected from them (M6.1), give meaning to their contribution (M6.2), intrinsically motivates participation when a contribution is acknowledged and recognized (M6.3), create trust between members and between members and company through visibility and credibility (M6.4), make participants feel in control of their*

activities when educated and provided with tools (M6.5), and enable a proper appeal on contributions with consideration of an individual's abilities and previous achievements (M6.6).



**Figure 7-7: Design Proposition # 6**

### 7.3.2 Company initiated innovation

Rothwell and Gardiner (1983) argue that customers (actual or potential) can play an important role in establishing an optimum set of design specifications for an innovative new product or process. Moreover, they emphasize that the customer's role should be active; it involves more than simple consultation, but rather includes using the customer as an actual partner in the design and development process. Akamavi (2005) concludes by stating that research about financial services innovation displays a gap in terms of empirical studies which examine how financial services monitor their customers' role in NPD, especially by involving them in NPD, since they are present during and must participate in the production process. Managers should therefore consider customers as active co-producers rather than as a passive patron-king or queen. They should clarify unambiguously roles of customers and train/educate them in order to be able self-serving buyers. They should regard customers as part-time workers when developing new services. Thus, managers and executives should strategically rethink the customer's role, and the design and management of a NSD-process. In analogy with consumer involvement in products (Laurent & Kapferer, 1985) and other company initiated activities (de Bono, 1998), we can observe that involvement is not a single indexed construct, but consists of several antecedents or facets:

1. the perceived importance of the participation, its personal meaning;
2. the perceived risk associated with the participation, which in turn has two facets:
3. the perceived importance of negative consequences in case of a poor or bad decision, and;
4. the perceived probability of making such a mistake.

5. the symbolic or sign value attributed by the customer to the participation, this differentiates functional risk from psychosocial risk;
6. the hedonic value of the participation, its emotional appeal, its ability to provide pleasure and affect.

An active participation is likely to be better recognized and appreciated by customers than a passive participation – the most important characteristic is the customer's willingness to participate and contribute (Pitta & Franzak, 1996). Volition is essential to all commitment (Salancik, 1977). Knowing that they are involved in innovating with the firm, knowing what the objectives are, knowing what is expected from them, are all factors that contribute to the psychosocial benefits that customers can get in their connection with a company. Companies that fully embrace 3CI go well beyond just passively waiting for consumers to provide suggestions or testing new ideas with them. These companies employ a wide variety of methods to actively stimulate the consumer's creativity. They also seek out consumers to work on early ideation, design and ultimately the marketing of new products. Additionally, this innovation process involves mining online social media for information on brands and products, to help uncover further insights. This will enhance customers' relation and loyalty with the company (Design Proposition # 1).

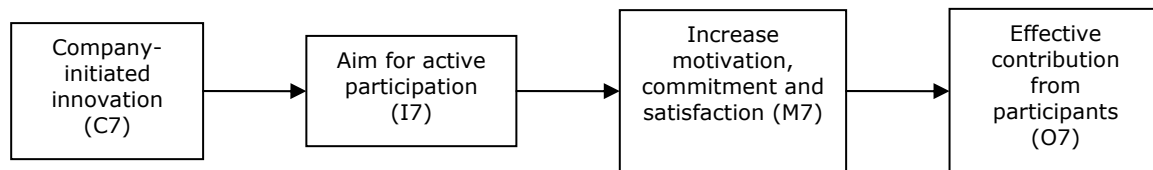
Related to an active participation is the amount of influence that the firm gives to the customer, meaning that the firm has to make clear what it will do with the customer input – either the input is unconditionally incorporated, or it can be ignored (Cavaye, 1995). All efforts to involve the customer have to be transparent and human (Winsor, 2006). Transparency implies (1) the provision of truly honest answers on questions asked (Powell, 2009); (2) keeping promises made to customers; (3) motivating one's actions, including rejections of contributions, suggestions or submissions; (4) reacting promptly and open on questions (Hunt, 2009); and (5) acknowledging and respecting the customers' privacy or confidentiality in, especially, B2B settings (Lewis, 1995). Customer participation can only be effective if customers can exert influence during the innovation process; the extent to which they are able to exert influence is related to their (perceived) power position (Cavaye, 1995). In order to be motivated, participants need to understand what is expected and why their contribution is deemed necessary by the firm (Wang & Fesenmaier, 2003). To commit participants there has to be a full disclosure of the entire process, from initial consumer comments to final product commercialization (Ogawa & Piller, 2006). Effective communication can ensure mutual understanding, make the customer feel in control and thus motivate the customer to collaborate willingly (Cavaye, 1995). As soon as the rules of the game have been explained in a clear way, people become masters in that game (de Bono, 1998).

McKeen et al. (1994) found in their study that user influence was positively related to user satisfaction regardless of the level of participation, meaning that a certain amount of influence should be given to participants, in order for them to be motivated to participate and experience the benefit of satisfaction. Athaide and Klink (2009) discovered that this influence is contingent on four situational characteristics: (1) the more knowledgeable the customer is perceived by the firm, the more influence the customer has in NPD, leading to customer-led or guided innovations; (2) the more customized the new product will be, the more influence the customer also has; (3) the more uncertain the technological setting, the more equal the relationship will be; and (4) in cases of a prior relationship history between customer and firm NPD will follow a bilateral approach (Sioukas, 1995), implying a symmetric relationship. In those cases where customers were perceived less knowledgeable, where there was no need for customization, and there was not any prior relationship, firms tended to have more influence on the NPD-process and outcome.



We can now propose a next design proposition for firms that want to initiate the customer co-creation:

**Design Proposition # 7** *Companies that want to co-create with their customers in a company-initiated innovation project (C7), should aim for an active participation (I7), i.e. informing the participants about the purpose, what is requested from them, procedures to be followed, and how the firm intends to use their contribution, because transparency removes barriers or inhibitions to participate, resulting in motivated, committed and satisfied participants (M7), so the most effective input will be acquired from participants (O7).*



**Figure 7-8: Design Proposition # 7**

## 7.4 Type of innovation

In our elaboration on the industry type (7.2.2) we have already discussed the suitability of product and service innovations. We will therefore look into the novelty and openness of the innovation.

### 7.4.1 The novelty of the innovation

As deliberated in sub-section 4.4.4 it seems that not so novel innovations, i.e. incremental and sustained innovations, are more likely to profit from customer co-creation, than really novel innovations (radical and disruptive ones). However, customers can contribute in a later stage of the radical innovation, when it comes to testing and giving feedback on concepts or prototypes. But we have also argued that novelty is in the eye of the beholder, and therefore not always clearly determinable. Some even assert that learning and innovating at an incremental level can ignite something bigger over the cumulative time of doing smaller improvements, and thus leads to radical or breakthrough innovations (Kanter, 2010; Winsor, 2006). Others advise to apply small and incremental improvements immediately, instead of saving them for a major and radical innovation, since customers are able to perceive prompt and affirmative results (Hunt, 2009). So, what does this mean for the suitability of really radical innovations are not suited for customer co-creation?

Consensus seems to exist on the customers' potential for incremental innovation. This type of innovation does not seem to require special conditions – aside from the already stated conditions in the previous design propositions – for involving customers and seems to be the *least achievable* kind of innovation a firm can obtain when involving its customers in the process.

Gardiner and Rothwell (1985), although recognizing that users can play a major role in basic innovation in some sectors, emphasize the crucial role of the user in re-innovation, that is, in major and minor improvements in product performance following its first commercial launch, i.e. in a late stage of the innovation. Thus they would argue that the user is more likely to be an important source of ideas leading to minor and possibly major product improvements, rather than basic innovations because:

"In the case of redesign and re-innovation - which is the dominant activity of most industrial sectors - the users already have some experience of earlier designs and innovations in the market. The experience tends to firm-up their attitudes about what they want and, often as importantly, what they do not want" (Gardiner & Rothwell, 1985:9).

A study by Magnusson (2009) finds that the users' knowledge of the underlying technology has an effect on their propensity to contribute with incremental or radical new ideas. The ideas from guided users - i.e. users that were taught the underlying technology and its limitations - tend to be more incremental whereas the pioneering, i.e. unguided, users' ideas are more radical. But, contrary to the users in the guided user scenarios, the users in the pioneering user scenarios have a propensity to produce ideas that challenge the prevailing dominant logic of the company. Salomo et al. (2003) even assert that customers who are experts in the market, in the product category, or in the core technologies, are very well able to provide sufficient high quality information in the context of radical innovations. We have also mentioned Bonner and Walker's study (2004) which showed that non related customers contribute better to radical innovations than close customers do because of their heterogeneity. All these studies suggest that customer co-creation in an *early* stage of a radical innovation, i.e. in the conception phase, is possible. In terms of new product and service innovativeness and project uncertainty, the greatest potential of customer co-creation is when developing really new products or services (new to the firms in terms of market newness or technology newness, see 2.5.2) in contrast to incremental innovation and radical innovation (Sandén, 2007).

Some literature argues that information shared by customers may be restricted to what is familiar to the customers (Bennett & Cooper, 1981). Firms may fail to develop innovative products because they are attentive to the needs of current customers (Enkel et al., 2005; Hamel & Prahalad, 1994). Lau et al. (2010) found that only sharing information with the customer is not correlated to product innovation. By limiting themselves to information acquired from current customers, manufacturers might restrict their capability of developing highly innovative products in a competitive environment. The findings of Lau et al. also show that product co-development with customers is not correlated to product innovation. This may help explain the fact that radical innovation is always introduced by new firms because new firms focus on new customers and their potential needs, not existing customers (Leonard, 1999). Existing firms that tightly serve or co-develop their products with current key customers may take the risk of being blindsided by a new generation of technology and market niches. It is thus suggested that firms need to actively seek new customers or even new markets to explore unarticulated needs for product innovation (Leonard, 1999).

However, practice shows that many firms discard ideas, coming from their customers during use or being 'out of the box', because of their alleged unfit with companies' strategy or policy (Olson & Bakke, 2001). Sometimes, ideas from customers are misinterpreted because designers do not recognize the language customers use, or assume that something else was meant by the customer, altering the ideas to their perspective. The LEGO case (see section 5.6), for instance, has shown us that customers are very able to crack MINDSTORMS' programming code within weeks after launch, or by developing own design tools for the LEGO bricks, both radical changes in the eyes of LEGO, while the company itself regarded these initially with mixed feelings.

These research and practice examples show that developing radical innovations with customer co-creation in an early stage of the innovation is not utopic, provided that companies place effort in 'listening' properly to its (potential) customers to elicit latent or not-articulated needs, as already proposed (Design Proposition # 3) and look for a diverse input, i.e. involving non customers from other markets as well (Bonner and Walker, 2004; Christensen & Raynor, 2003). And, as we have seen, methods for listening

to hidden and tacit needs and ideas can be found in the outcome-driven approach (Ulwick, 2005), metaphor-based in-depth interviews (Olson et al., 2008; Zaltman, 2003), the customer journey approach (Voss & Zomerdijs, 2007) and netnography (Kozinets, 2002).

We therefore propose:

**Design Proposition # 8** *In determining the type of innovation, suited for customer co-creation (C8) the application of traditional market research and customer involvement tools (I8.1) are likely to lead to (at least) incremental innovation (O8.1), because the tools are suited to elicit customer articulated and identifiable needs that lead to minor or incremental improvement to existing products and services (M8.1). To involve customers in incremental or sustained product, service and process innovations, adopting a customer orientation (I8.1), are the minimum requirements to warrant an effective customer input (O8), since these are the most suitable orientation and tools to effectively involve customers in innovations (M8). Application of customer listening methods, such as the outcome-driven approach, the metaphor-based interview, customer journey approach and/or netnography in the front end of the innovation process (I8.2) will more likely lead to really novel and radical innovations (O8.2) since these methods are capable of gaining access to tacit customer knowledge and ideas (M8.2), which are needed to develop a customer-centered radical or breakthrough innovation.*

In a schematic diagram:

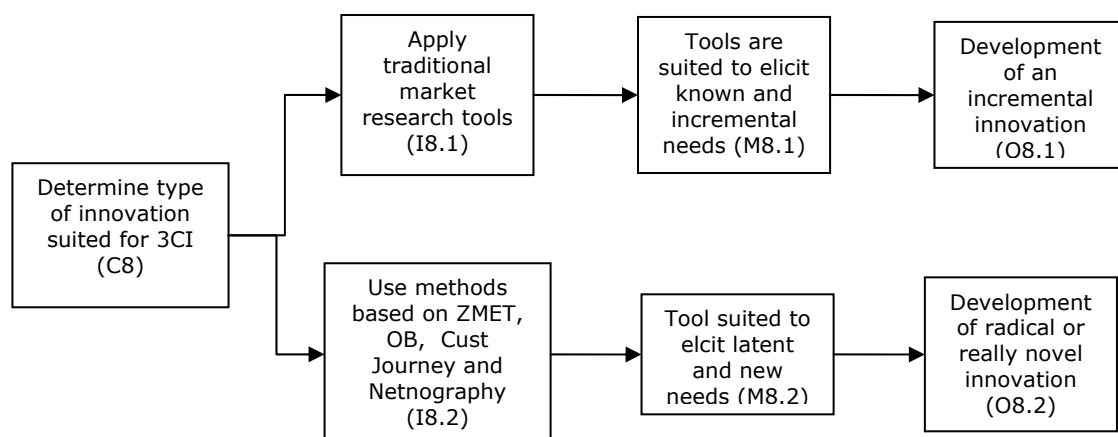


Figure 7-9: Design Proposition # 8

#### 7.4.2 Openness of the innovation

As we have stated in sub-section 4.4.4, customer co-creation in innovations can be regarded as Open Innovation. In Open Innovation firms typically use external sources for ideas, patents, resources, and such, to conduct the innovation process. Chesbrough (2003) treats the Open Innovation as a phenomenon that took place in the last 15 to 20 years, suggesting that before that time most companies were practicing a Closed innovation approach, entailing a completely internal sourcing of innovations. We have observed, however, that customer co-creation in NPD is not a new phenomenon, consisting of examples that go before the 1980s, implying that customer co-creation can not really be considered 'open' in Chesbrough's sense. We think we therefore have to mitigate the term 'open' in that respect. 'Open Innovation' and 'Closed Innovation' should not be treated as dichotomous terms, opposed to and excluding each other, but as two extremes of a continuum. In this approach 'closed innovation' stands for innovation with a minimal set of external partners – they are like private clubs, e.g. collaboration

between a specific supplier and one of its customers to realize a customized innovation. In totally open collaboration, which reaches its extreme with crowdsourcing, everyone (suppliers, customers, designers, research institutions, inventors, students, hobbyists, and even competitors) can participate (Pisano & Verganti, 2008).

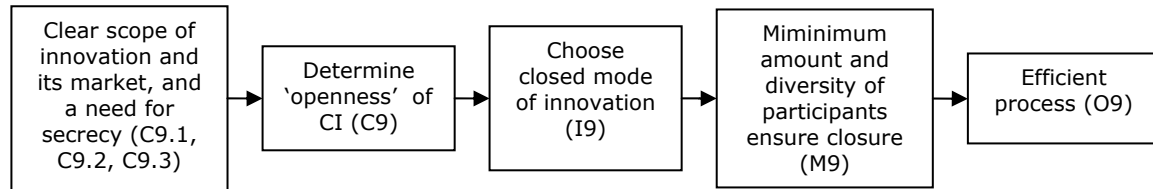
When a firm uses a closed mode, it is making two implicit assumptions: that it can identify the knowledge domain from which the best solution to its problem will come, and that it can pick the right collaborators in that field (Pisano & Verganti, 2008). The more specific the innovation is for a customer (customized), the more homogenous and well known the market is, the more comprehensive and finished the idea for the innovation is (concept, prototype, test ready product, or, in other words, during the implementation stage of the innovation process), or the more secrecy (IP protection) is required regarding the innovation, the better suited the closed mode of innovating will be for the firm. We can see LEGO applying this approach in the MINDSTORMS NXT case, by inviting only four MUPs to think along about the design of the new robot module (Koerner, 2006). The previously described Client Co-Creation Lab also consisted of pilots, in which markets were well known and prototypes or concepts were available. Customer co-creation could be restricted to a small, homogenous number of participants.

The big advantage of an open network is its potential to attract an extremely large number of problem solvers and, consequently, a vast number of ideas. Firms do not need to identify either the best knowledge domains or the most appropriate experts in those domains in advance. It's like throwing an open house party: just make it known the company is having a party and provide the right inducements, and (hope) the right people will show up. With open participation, the company doesn't need to know its contributors. Indeed, the fact that it doesn't know them can be particularly valuable; interesting innovative solutions can come from people or organizations it might never have imagined had something to contribute (Pisano & Verganti, 2008). Firms may want to source as much ideas or customer input as possible to ensure that the great idea or input is obtained. The need for many ideas occur typically in the conception / ideation stage and the re-innovation stage, so we might expect that these stages are suited for the completely open mode. Disadvantage of this approach, however, is that the cost of searching for, screening, selecting contributors and contributions grow as the network of participants becomes larger and can become prohibitive – see our case about IBM's Innovation Jam in section 5.5. An open approach can also expose the project too much to competitors, increasing project risk and time pressure. Choosing an open approach will also have some consequences for other choices to be made, concerning customer co-creation. To pursue the open approach, that is, to source a large amount of participants as efficiently possible it is preferred that the tasking of the participants can be divided in small, well-defined discrete chunks of works that participants can work on autonomously at low cost (Bughin et al., 2008; Tapscott & Williams, 2007), e.g. open source initiatives (see section 4.9). Dividing a task in small, well-defined chunks enables participants to stay focused on the task, instead of the grand total (de Bono, 1998). A large amount of participants also limit the possible interaction channels to the online approach, because the offline approach will require too much costs or hassle (travel, logistics, venues). Therefore it has to be necessary that engagement and tasking of the participating customers can be conducted through the online channel (Prahalad & Krishnan, 2008). For instance, an online approach will be particular difficult to implement in case of the prototype testing of high tech or bulk products.

We therefore propose:

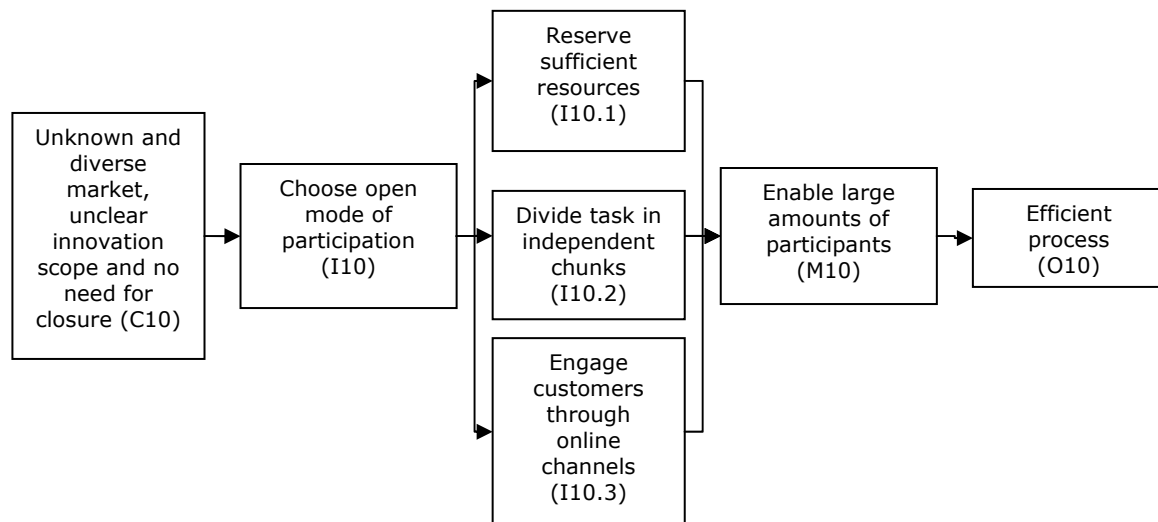
**Design Proposition # 9** *In determining the 'openness' of the 3CI-innovation (C9) firms should choose for the 'closed mode' of involvement (I9.1) when they have a clear scope of the innovation deliverables in terms of a concept, prototype or test ready product (C9.1) – thus typically in the implementation stage of the innovation - , a clearly*

defined and known market or customer, for which the innovation is specifically intended (**C9.2**), and IP-protection or non disclosure for competitors is needed (**C9.3**), because these conditions will limit the amount and diversity of participants to a necessary minimum (**M9**), which is needed to ensure secrecy or closure throughout the innovation, in order for the firm to efficiently obtain the most relevant, specific and useful customer input for the innovation (**O9**).



**Figure 7-10: Design proposition # 9**

**Design Proposition # 10** When the innovation scope is unclear – typical in the conception and re-innovation stages of the innovation process - , the intended market unknown and project disclosure poses no problem (**C10**) firms can choose for the 'open mode' of 3CI (**I10**). In order to manage customer input efficiently (**O10**) for a 'totally open mode' involvement of customers, firms have to reserve sufficient resources (**I10.1**), divide the required customer contribution in 'digestible' and independent chunks for participants (**I10.2**), and engage participants through online and virtual channels (**I10.3**) because these actions enable the participation and management of a large group of participants (**M10**).



**Figure 7-11: Design Proposition # 10**

## 7.5 Conclusion to this chapter

In this chapter we developed the first 10 design propositions in developing our protocol for Customer co-creation in Innovations (3CI). These propositions reflected the context decisions to be made, i.e. the appropriate strategy, the suitability of the firm's market, the initiator for the co-creation (firm or customer), and the type of innovation (incremental vs. radical, open vs. closed mode). Wherever appropriate we have also reviewed the appropriate methods, tools and techniques for the best implementation of the interventions. These are the first decisions the firm has to take when undertaking the

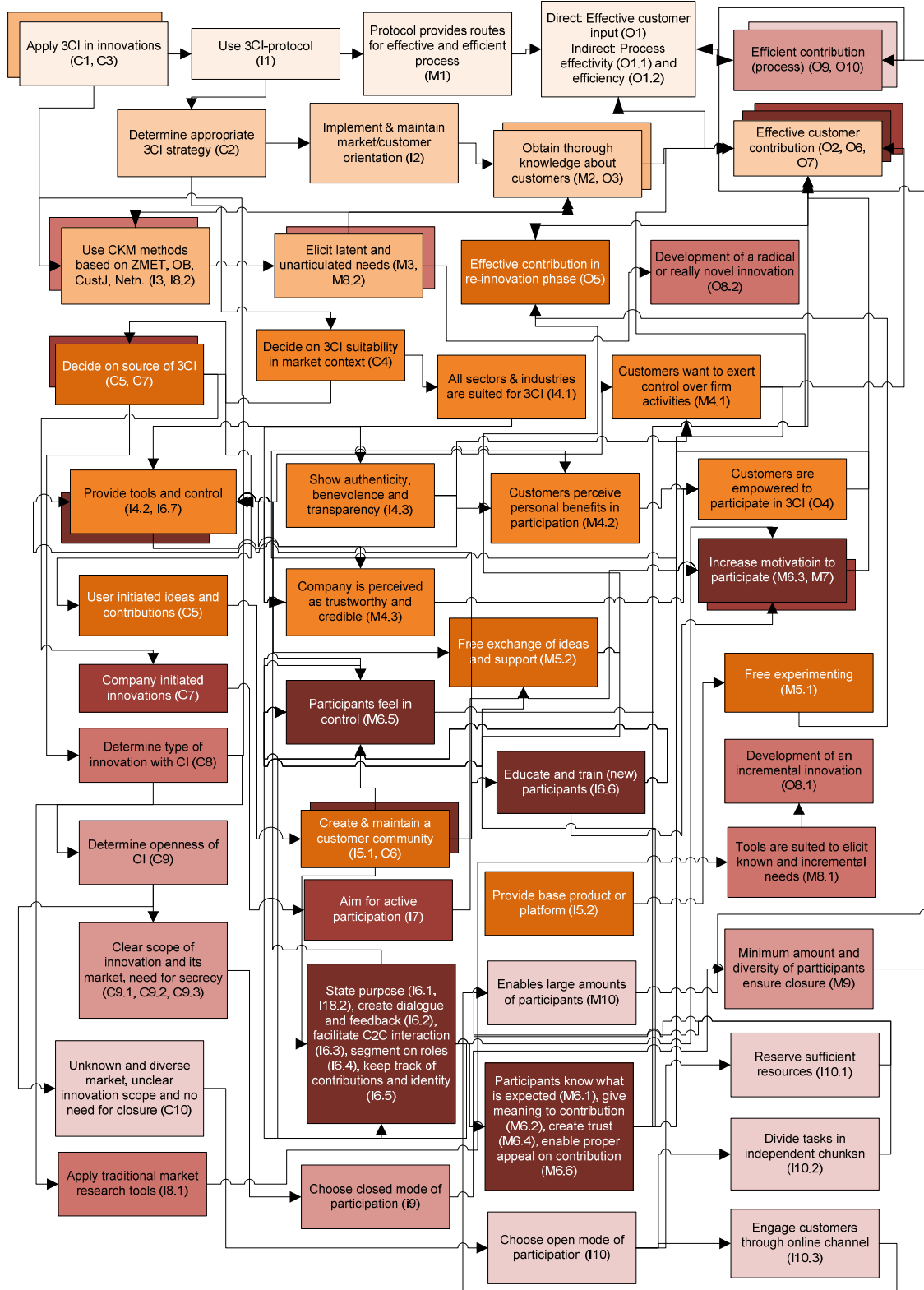
3CI Journey. Only when these decisions are made a next step, i.e. determining which customer requirements are appropriate, can be made.

Summarized, we can state that any organization can co-create with its customers in innovations, provided that they adopt and maintain a market oriented strategy, along with the necessary tools, space, freedom and transparency for customers to participate. Customer co-creation leads to at least effective incremental innovations, but when the organization applies Customer Knowledge Methods it increases the chance for an effective radical innovation. If secrecy is required or when applied in the middle stage of the innovation process (implementation), a closed mode approach of involvement can be followed, entailing that a minimum amount and diversity of external participants are involved, provided that there is a clear scope of innovation objectives and the market it is intended for, i.e. usually in the implementation stage. Finally, organizations can either rely on customer-initiated ideas or initiate an innovation itself. In the first approach the organization is recommended to create and maintain a customer community, which can be observed and interacted with to elicit the customers' ideas.

It is obvious that most propositions do not stand alone, but are related to other propositions. In Figure 7-12 these design propositions are combined in a diagram, depicting the decisions to make, interventions to apply, and expected outcomes for the firm. In this diagram this interrelationship is made visible. In some situations an intervention is an input for another intervention. In these cases we have connected the appropriate blocks.

We will now proceed with the design propositions regarding the customer requirements for involvement, such as competences, ways to engage and motivate, and number of participants.

**Figure 7-12: Integrated design propositions for the context of 3CI**



# Chapter 8 Design propositions regarding the customer

## 8.1 Introduction

In the previous chapter we have developed 10 design propositions which gave the conditions and premises in which a company can justify its intentions and ambitions to co-create with customers in one or more innovation projects. Given that justification, the company can now decide on the type of customers to engage with and involve, depending the choices it has made regarding the source, the type and the openness of the innovation. In this chapter we will therefore develop the necessary design proposition regarding the type and amount of customers to involve. We will also look at the principles the company has to take into consideration when engaging these customers, so the chances of a premature disengagement or disappointing results are minimized.

## 8.2 The expertise and competences of the customer

### 8.2.1 Introduction to this section

In this section we will look into the question of the type of customers to involve. In this respect, it is not our intention to address questions like age, nationality, gender, educational level, profession, and such, since such characteristics depend on the firm's market or customer base. Besides, with contemporary technology means all kind of nationalities, genders, geographic dispersion, age, etc. can be identified and targeted as needed (Geerts, 2009; Li & Bernoff, 2008). Without further ado we propose that participants should reflect a representative sample of customers considering these characteristics – in the case that they matter – otherwise the innovations will have little general appeal (Gardiner & Rothwell, 1985; Leonard, 1999). According to Lusch et al. (1992) the decision coming from a customer to participate in co-creation depends on or is contingent on the level of skill or knowledge possessed (expertise capacity), resource capacity, time capacity, economic rewards, psychological rewards, trust and control the customer perceives. We will later address aspects like economic and psychological rewards, trust and control. We will first focus on aspects like *expertise, psychological and social competences*, which entail the participant's capacities. Expertise in a product category can be divided in use experience, i.e. the frequency of use or relationship with the firm, and product-related knowledge, like product architecture, technology and materials (Lüthje, 2004). Psychological competences reflect competences, such as creativity, innovativeness and intelligence, social competences refer to communication and relationship skills (Ives & Olson, 1984). Skills that are required in order to perform customers' roles in NPD are mostly of a social and cognitive kind rather than technical (Chervonnaya, 2003). Heiskanen et al. (2010) assert that the ability to contribute to innovation is not an inherent quality of the users themselves. It is constituted by the actions of the producer company in fostering interaction and in responding to users' initiatives, which we will discuss later.

We also want to emphasize that defining requirements for customer participation for innovation purposes is a very different and distinctive activity than the process of selecting partner for strategic alliances. In alliances it is usually the aim to collaborate on more business activities, e.g. procurement, distribution, production, marketing, etc., than just in new product development alone (de Man et al., 2000; Lewis, 1995). Alliances also require a long time commitment from partners, making the list of requirements and needed competences and knowledge from partners more extensive than for NPD purposes, often requiring contractual agreements. Short term alliances imply high costs



(Lewis, 1995) and are not recommended in that respect. Customer co-creation in an innovation is, on the other hand, short term collaboration, making long partner search processes and the use of contracts to govern the collaboration unwanted. The kind of alliance that is indicated here resembles the informal innovation network (van Aken & Weggeman, 2000), but differs nonetheless in many aspects.

### **8.2.2 Use experience**

#### **The end user**

Use experience suggests that the participant is a user of the product or service in question. In the past (1920s-1930s) the term 'customer' primarily referred to distributors who purchased goods and made payments. Starting about the 1950s, the focus shifted from distributors to end users and their needs and wants. Today the appropriate focus appears to be the market, which includes end users and distributors as well (Kohli & Jaworski, 1990). But, in spite of this definition, a customer can still have many different meanings (Kanter, 2001). For instance, in B2B setting the customer consists of distributors, management, procurers, the decision making unit, and the operational end users. Insurance companies, for example, make little use of end customers in NSD, since they see the intermediary as the first-line customer (Johne & Storey, 1998). Even in B2C contexts the customer or end user may not be clearly definable: is it in a household the parent that pays for the product or the child that consumes it? Barki and Hartwick (1994) define a user as a person who, as part of his or her regular job, either used the system hands-on or made use of the outputs produced by the system, although they do not split up the user in different types. In the TQM and QFD movement we are suggested to focus on the segment that achieves the highest benefit or result, or which is likely to satisfy most users (Herstatt, 2002; Mazur et al., 1995). In case a company is a link in a supply chain, or the developer of a certain product that is manufactured elsewhere, than distributed by, and such, it is best to direct the QFD activities on the *end user*, the keystone customer, because they are the one's that bring money in, while all the others take the money out, and without the end user's approval or satisfaction, the whole chain could collapse (Mazur, 1994; Ronney et al., 2000). Development time is reduced when end users are included in development teams (Kessler & Chakrabarti, 1996); this triggers quicker action and helps employees to pay attention to new ideas, solutions and opportunities (van de Ven, 1986). End users can help to develop on product's concept and features (Rosenthal, 1992). Firms should focus more on the end customer and less on the industry or on the technology in convergent industries (Wind & Mahajan, 2002). Customer-based assets are critical for achieving competitive advantage in these industries (Ancarani & Shankar, 2003). We can therefore conclude that 3CI efforts should be aimed at the end users of the product or product class.

In this respect we will also have to be aware of the fact that one single product or product category may know different kind (diversity) of end users, which all can be involved. For instance, in the development of the Boeing 787 Dreamliner, Boeing involved airline pilots when viewing system elements and aspects of flight conditions, cabin crew personnel were consulted regarding the use of cabin equipment, maintenance personnel had a say in the maintenance ease and procedures, airline company management were consulted in respect of flight scheduling, airport procedures and accessibility. Of course the ultimate end user of the airplane, the passenger, was not overlooked in this process.

Seybold (2006) acknowledges the view to focus on the end user or customer, and not necessarily the customer that pays for the product or service, or an existing customer – participants could even be customers to the firm's competitors. In fact, the more such users can benefit from the solution that is going to be developed, the more interested they are to participate (Urban & von Hippel, 1988), and the better suited they are for involvement. A practical proxy for expected benefit could be user dissatisfaction with

existing products, the customers with highest demands, or the customers that have a great product involvement (perceived importance) (Nambisan & Baron, 2007). Finding the most demanding customer in a particular sector is a valuable approach; stretching the concept to meet their needs will ensure that most other potential users come within the envelope (Rothwell & Gardiner, 1983; Tidd et al., 2001). Moreover, the fact that different patterns exist between different product classes, highlights the need for would-be innovators to adopt different design strategies for different types of users who operate at different levels of sophistication (Rothwell & Gardiner, 1985).

In a study among gamers it was found that experience with the game is an important antecedent of user innovativeness (Prügl & Schreier, 2006), confirming that the product or product class has to be known by user innovators. Lüthje (2004) therefore posits that the motivation and qualification for innovation in a product field can only be understood in the context of that particular product field. Consequently, he proposes that a user who might initiate the development in one market is not necessarily innovating in other product fields. Morrison et al. (2004) and Leonard (Leonard, 1999) come with a comparable result that being a lead user is not a binary or dichotomy trait – you are a lead user or not –, but a continuous one, implying that in certain situations a person, which has previously exhibited lead user characteristics, does not necessary have to be a lead user too. Surowiecki (2004) also argues that in order to make a group smart and to find the an answer to a problem, its members (the individual participants) need to have some problem-related information, in our context meaning that use experience is favored above the involvement of totally unknowledgeable customers.

Looking at our expose on the modes of customer co-creation in 3.5 we see that market research can affect all kind of people – customers, potential customers, users, non-users – depending on the intention and scope of the market research. Crowdsourcing, on the other hand, is directed at the ‘crowd’ implying anyone that is motivated to respond and participate, whether a user or not. Open Source Software also seems to appeal to anyone interested in developing a particular piece of the software, whether they intend to make use of it or not. A study by Lau et al. (2010) among Hong Kong manufacturers show that companies co-develop new products only with new customers and lead users instead of current ones for product innovation. User innovations come forth from lead users, which are people that already use the product or product category. A common denominator seems to be that participants are somehow familiar with or experienced in the use and outcomes of the product or product class. As Trendwatching.com, a well known Dutch consultancy on consumer trends indicated in 2007:

“Trysumers are transient, experienced consumers who are becoming more daring in how and what they consume, thanks to a wide range of societal and technological changes. As saturated, experienced consumers can draw on plenty of past experiences, and know that many more experiences will follow, it's easier to cope with possible disappointment stemming from trying out the unknown. Freed from the shackles of convention and scarcity, immune to most advertising, and enjoying full access to information, reviews and navigation, experienced consumers are trying out new appliances, new services, new flavours, new authors, new destinations, new artists, new outfits, new relationships, new anything with post mass-market gusto. Companies that are latching on to the trend are enabling such experimentation through ‘rent instead of buy’ deals – from handbag subscriptions to super car sharing (Evers, 2007)”.

When aiming for a disruptive innovation companies must refrain from listening too much, or even involving their regular customers, usually either high-end customers or just potential customers (Christensen & Raynor, 2003). This might be interpreted in such a way that if a company wants to develop a disruptive innovation that it would be wise to aim for the involvement of low-end customers, or even non-customers. Mascitelli (2000) proposes that if we accept the notion that breakthrough innovations are a manifestation of subconscious knowledge and experience, it seems that every employee might possess

a vast, untapped potential to create value. We can easily stretch this viewpoint by stating that it also applies to customers or ordinary people. Anthony et al. (2006) even suggests to look at a company's worst customers – which we can definitely not perceive as lead customers – when developing disruptive innovations.

Several authors emphasize the dangers of focusing on existing customers only (Danneels, 2002;2003;2004; Hamel & Prahalad, 1994; Slater & Narver, 1995); firms tend to forget their potential customers, thereby stepping in the trap of sustained innovations (Christensen & Bower, 1996). For instance, interacting with only *lead* customers, as Seybold (2006) suggests, could lead to a state of enactment (Weick, 1988), followed by commitment to these lead customers, which could be detrimental to the firm, because the enactment yields only knowledge of these lead customers (Danneels, 2004). In Biemans' study (1991) mostly potential users were involved, because there were no existing users for the medical innovations he included in his research. Potential users to test new equipment were mostly selected because of their reputed know-how, an existing relationship and the perceived commercial potential of these users. Remarkably, in only one case the manufacturer mentioned the representativeness of the user for the specific market segments as strongly influencing the selection of user sites. Lilien et al. (2002) found that innovations by users offering breakthrough potential for a target market will often be found among lead users entirely outside of a target market population. A possibility to involve non-customers or would-be customers that expose some experience is to analyze analogous fields. Example: A producer of drills would like to understand how the problem of drilling through extremely hard sub-surfaces in other, analogous fields of applications. Discussions with operators of diamond drill machines used in oil field exploration could provide significant input and impulse innovation project. We call these "Analogous" users (Herstatt, 2002).

Another question is whether to make use of customers that have been involved in previous projects of NPD. It would be expected that customers who have been involved in past collaborative activities with the firm are more likely to have developed fine-grained channels to exchange complex, tacit information (Athaide & Klink, 2009; Nambisan & Baron, 2007; Sioukas, 1995). Hargadon and Sutton (1997), however, found that having contacts in multiple sectors and industries, leads to the introduction of successful new products using knowledge gained from those industries. This would suggest that a diverse set of participants, preferably others than the firm is accustomed to, should be involved. Bonner and Walker (2004) investigated this implication and found that influential customers with whom there were strong past relationships tend to make the most effective contributions to a NPD project, but, more to incremental than novel NPD. Superior products are more likely to be developed for highly innovative projects when a firm utilizes a diverse mix of influential customers. When developing incremental products, success is more likely when using a homogenous set of customers. Using heterogeneous customers for incremental innovations, however, led to low product performance. This, because homogenous customers have a high degree of accrued product knowledge. However, not clear is in what innovation activities or process stages co-creation with a diverse set of customers is most beneficial. Page (Page, 2007) found that diversity is important in problem solving, implying that diversity or heterogeneity in customer co-creation is best suited for the conception/ideation stage, and probably also in the re-innovation stage. Diversity is one of the major strengths of a crowd (Surowiecki, 2004); we will address this issue when discussing the amount of participants in co-creation.

Finally, employees can be end users of a firm's products as well. Kotro (2007) examined such a situation in which the members of the product development team are inspired and informed by their communities-of-practices of sports. She introduces the concept of *hobbyist knowing* which is created by participation in particular social and physical circumstances of doing sports. Hobbyist knowing allows NPD teams to translate and bring

not only individual insights but also values and ideals of communities into team members' work, thus making them into a resource in product development process of desired objects. Engaging end users from the NPD team, however, may lead to an excuse for not listening to external users, when there is a shortage of time, funding or even interest.

We therefore propagate to involve existing and potential customers which have some experience with the product or product category in the innovation process. Use experience emerges via the frequency of using products. Like in all creative problem solving processes, use experience is needed to experience and systematically analyze the existing problems that arise from using the products currently available in the market and perceive whether improvement or change is beneficial.

**Design Proposition # 11** *To decide on the type of customer to co-create with (C11), participating customers should be selected on their affinity with the domain in which the innovation will take place, meaning that they should have some experience in being a user of the product or service class (I11), so the firm can expect relevant and good input (O11). In this respect it is not necessary for the users to be an active or existing customer of the innovating firm. Experience with the domain is necessary, because only then will participants be able to perceive possible benefits from product or service improvements in the context of its use (M11).*

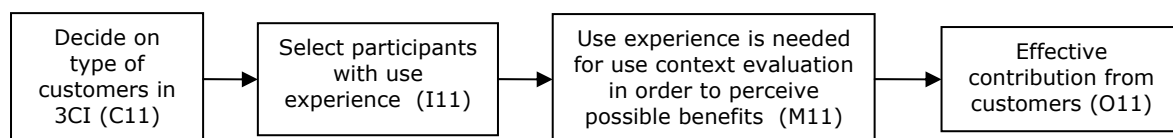


Figure 8-1: Design Proposition # 11

### 8.2.3 Product-related expertise

The greater the technical or product-related knowledge of the customer, the more likely it is that successful products will be developed (Hanna et al., 1995). Because of their technical knowledge, such customers are better capable of perceiving and estimating the product benefits resulting from the innovation (Conway, 1993). Shaw (1985:290) notes the dominance of the user in the development process for medical equipment, particularly with respect to basic and major improvement innovations. This he believes:

"...should be expected where state-of-the-art clinical and diagnostic knowledge resides in the user, and the user has a high probability of deriving output-embodied benefit from the innovation...The closer these benefits are to the state-of-the-art advances, the greater the benefit to the clinician and therefore, the more involved he will want to be. Where these benefits are not benefit, he will try not to get involved".

The relevance of this factor will, however, vary between product categories. In his study of software applications innovations for example, Voss (1985:117) found that in 10 of the 16 user-active cases the user did not have computer or systems expertise. He thus suggests that:

"... some level of familiarity with computer technology, rather than technical expertise, is sufficient for applications innovations to take place".

The main variable at play here appears to be the nature of the technology. Whilst familiarity and do-it-yourself learning is probably sufficient to develop novel software applications, no doubt it is entirely insufficient in the development of say medical equipment or computer hardware. Also, we could question the proposition that technical benefits are the main drivers for an effective input from customers. As we will see, a

customer or user may also derive benefit from involvement through the desire for recognition or personal satisfaction of those individuals involved. Technically progressive customers are also likely to be more technically demanding of their suppliers, bringing about a higher incidence of user-dominated and joint user-manufacturer innovation projects. Thus one would expect a market characterized by un-innovative and technically non-demanding or unprogressive users to exhibit a very low incidence of user-dominated innovation (Conway, 1993).

As has been described previously in our review of *user innovation* (see section 4.8), *lead users* seem to be a good source for companies to involve in their innovation projects. This seems to dismiss the idea that ordinary customers aren't capable to contribute. Gruner and Homburg (2000) found in their study that, as for the characteristics of customers which are involved, the results are in order of best success to least success: Lead users, Financially attractive customers (potential market), Close customers (relations), and Technical attractive (no positive influence on success).

However, looking more accurately at von Hippel's statement:

"In many product categories, the constraint of users to the familiar does not lessen the ability of marketing research to evaluate needs for new products by analyzing typical users. In the relatively slow-moving world of steels and autos, for example, new models often do not differ radically from their immediate predecessors. Therefore, even the "new" is reasonably familiar and the typical user can thus play a valuable role in the development of new products. In contrast, in high technology industries, the world moves so rapidly that the related real-world experience of ordinary users is often rendered obsolete by the time a product is developed or during the time of its projected commercial lifetime. For such industries I propose that lead users who do have real life experience with novel product or process needs are essential to accurate marketing research. Although the insights of lead users are as constrained to the familiar as those of other users, lead users are familiar with conditions that lie in the future for most-and, so, are in a position to provide accurate data on needs related to such future conditions. (von Hippel, 1988:106-107)

Von Hippel does not exclude the potential of ordinary customers, but relate their limitations in high technology settings, when it is about a radical or disruptive innovation. Several scholars support this viewpoint because the involvement aims at users, other than current customers (Danneels, 2004). In a personal interview with the thesis' author von Hippel indicated that in order to reach radical innovation, it is necessary to engage with lead users. Ordinary users might have difficulties in providing valid evaluations of concepts and prototypes as no reference product for the radical innovation exists (Schoormans et al., 1995). But, as we have indicated earlier, accessing this knowledge from the perspective of use outcomes, as propagated by the outcome based approach (Ulwick, 2005). Another barrier to ordinary users contributing to radical innovations is that they might lack motivation that stems from high anticipated switching costs and from the fear that existing knowledge becomes obsolete, barriers that lead users do not know (Lettl et al., 2006a). This proposition is contradicted by Deszca et al. (1999) who state that the Lead User Approach focuses largely on market category issues only, and will therefore fail to develop breakthrough products. Deszca et al. however do not propose alternatives for this problem.

Von Hippel c.s. (Urban & von Hippel, 1988; von Hippel, 1986) propose a systematic method for searching and engaging lead users by companies looking for them. Morrison et al. (2004) found a high correlation between lead user characteristics and the characteristics of adopters as a function of time of adoption, meaning that lead users are early adopters. Lead users are usually the first customers with a serious problem or complaint, so companies should spend resources to identify and exploit first reporters of problems (Pitta et al., 1996). According to Lettl et al. (2006a) lead user characteristics as defined by von Hippel are not enough for radical innovations. The characteristics have to

be supplemented by additional ones, like openness to new technologies, embeddedness into a supportive context (resources, access to interdisciplinary know-how) and intrinsic motivation. If the aim is to effectively identify attractive user ideas from an unknown population, all search criteria might be employed at once: the 2 lead user components, as well as both resource-related variables: technical expertise and community-based resources (Franke et al., 2006). Based on these additional characteristics, finding these lead users might pose a problem for companies that want to involve them, as Alam (2006b) found in his study with financial services, or might be perceived as costly and troublesome (Herstatt & von Hippel, 1992; Olson & Bakke, 2001). A major challenge in applying the lead-user method has been the reliable and efficient identification of such users (Lilien et al., 2002; Lüthje & Herstatt, 2004; Olson & Bakke, 2001), leading to efforts (still in progress) of researchers to design a standardized and efficient process for the Lead User Approach (Hienerth & Pötz, 2006). This problem is most severe in consumer goods fields where overall user populations appear to be unidentifiable because of their large size (Pitta & Franzak, 1996; Schreier & Prügl, 2008). The critical cost of the lead user approach is the difficulty of identifying truly advanced users who are willing to participate (Jeppesen, 2005). Schreier and Prügl (2008) examined the antecedents and consequences of lead users in the underlying consumer fields in order to assist firms on identifying them for innovation projects. They argue that lead users have (1) a great knowledge of the consumer fields in the context of their needs, (2) a high user experience, (3) an internal locus of control for their outcomes, and (4) an innovative personality. They also found that lead users adopt new products in the underlying field faster and more heavily than others; they are the so called "innovators" (Rogers, 1995). As a consequence of their findings Schreier and Prügl (2008) suggest that firms who are looking for lead users to participate in innovation projects should (1) focus on communities of highly experienced users, (2) and then make use of the pyramid networking technique by asking around who people with a strong interest in the field consider as more expert than themselves. The result of this search process should be an effective and efficient identification of the lead users in the underlying field. Firms should be careful about pigeonholing specific customers as "innovators" or "laggards"; there are cases known where customers act as innovator on the one product, while reacting as laggards on the other (Schmidt & Druehl, 2008). Spann et al. (2009) also propose a method for finding and selecting lead users through virtual stock markets VSM). Participating in a virtual stock market poses such a challenge that lead users are expected to be highly involved and perform better than other participants, the authors argue. However, their research shows that lead users are not automatically better performers in a VSM.

Another problem reported by Olson and Bakke (2001) that appears internally in the firm is that developers have a tendency to abandon the method because they perceive results of user interaction as being too ambiguous or overly simplistic. And, finding your lead users, does not guarantee the reception of great ideas. When dealing with ordinary information that is well communicated and understood, this does not create much of a problem— however, this is not the case when transferring knowledge related to the lead users. The information held by the lead users is hard to communicate and transferred from the lead users to the firm; therefore von Hippel developed the notion of *sticky information*, which is present when user information is "costly to acquire, transfer, and use" (von Hippel, 1994:429). The stickiness of a unit of information is defined as "the incremental expenditure required to transfer that unit of information to a specified locus in a form usable by a given information seeker" (von Hippel, 1994:430). It is furthermore deduced that when the cost is low, information stickiness is equally low and when it is high, stickiness is equally high. As von Hippel states:

"When information transfer costs are a significant component of the costs of the planned problem-solving work, it is reasonable that there will be a tendency to carry out innovation-

related problem-solving activity out at the locus of sticky information, other things being equal" (1994:432).

This means that where information 'sticks' with users, that innovation will be most probable initiated by users, and the other way around. Ogawa (1998) tested von Hippel's hypothesis in a study of 24 innovations in the Japanese conveyor systems industry and found empirical evidence that von Hippel's hypothesis: "That innovation-related problem-solving activity often is conducted out at the locus of the sticky information" was valid. This empirical evidence is important, because another hypothesis with regard to locus of innovation, the 'expected profit hypothesis' that maintains that, of the players involved, the player who expects the highest profit from the innovation is most likely to innovate (von Hippel, 1988), might not be practicable in sectors where rents do not serve as an incentive, for example, in government laboratories. In this sense, 'stickiness of innovation-related information' could be another variable used in predicting the locus of innovation in such sectors. To sum up, it is found that lead users hold sticky information and that the sticky information they hold is valuable but also expensive to transfer. In a later publication von Hippel (1998) claims that the cost of extracting sticky information can be lowered by utilizing advances in computerization. The idea is that computerization could lead to an increasingly common pattern of innovation task partitioning in which users are 'empowered' to customize products and services for themselves at user sites. Von Hippel concludes that product and service development could increasingly be transferred to users when: (1) the supplier faces heterogeneous demand for a given type of product or service (that is, many of the users place a high value on custom solutions), (2) agency costs experienced by users who outsource design activities are high, implying that the stickiness of application-specific user information is high, (3) the stickiness of information held by suppliers that is relevant to application-specific problem-solving is low. When this is the case a user toolkit should be designed for a specific product, service or a production system, so that the tool-kits "within those general constraints, they give users real freedom to innovate, allowing them to develop their custom product via iterative trial-and-error. That is, users can create a preliminary design, simulate or prototype it, evaluate its functioning in their own use environment, and then iteratively improve it until satisfied. As the concept is evolving, toolkits guide the user to insure that the completed design can be produced on the intended production system without change" (von Hippel, 2001b:247). Piller and Walcher (2006) enhance this idea of an online toolkit by adding a competition to select consumer lead users. We will elaborate on these toolkits in section 4.4.5 on techniques and tools to support the customer co-creation.

Von Hippel limits approaches to co-creation to an elite and very carefully selected group of people. It is not yet clear whether this elite group can represent and speak for the majority who will actually use the goods and services that are being designed and developed, even though his research seems to indicate that (Urban & von Hippel, 1988; von Hippel, 1988). Lead users have been identified also to be innovators and early adopters (Morrison et al., 2004; Schreier & Prügl, 2008), as Rogers (1995) designates people which usually are the first to adopt new innovations. Lead users may well be ahead of the market trend, but could have such a jumpstart from ordinary users, creating a 'chasm' between them and the following groups of adopters (Deszca et al., 1999; Moore, 2002). Choosing the representative participant is not always as simple as it sounds. For example, the producer must determine that he has chosen an innovative user, i.e. one with a track record of purchasing up-to-date equipment and of utilizing it appropriately. Secondly, care must be taken to establish contact with users whose needs are typical of the industry generally; the choice of an unrepresentative user will result in the design of a product of very narrow market appeal (Gardiner & Rothwell, 1985; Rothwell & Gardiner, 1983; Rothwell et al., 1983). Alam (2006b), for example, found that those firms that obtained input from lead users, conducted further probes into lead user input by discussing the ideas with a large sample of average customers. The responding

managers strongly recommended such probes, because it occurred that the average customers were not always interested in input obtained from lead users.

Lettl et al. (2009) investigated the required knowledge and training of the customer to participate in technological innovations. In order to do that they focus on independent inventors and compare them to corporate inventors on two properties, i.e. technological diversity – the breadth of technological knowledge, referring to the antecedent quality of the inventor's body of knowledge which allows creativity and generates the perspectives and insights into a given problem, or in simple words: different knowledge domains are covered – , and specialization – depth of knowledge in a specific knowledge domain. They find that diversity is disadvantageous for independent inventors and advantageous for corporate inventors; the more diverse the prior knowledge of the inventor, the lower the impact of the invention. In their research, most independent inventors are hobbyists, meaning that they have small/low technological impact. Corporate inventions have more technological impact. But, because of community membership (peer review) and a lack of company rigidity (no cross-functional communication), independent inventors can have more technological impact with specialization than corporate inventors. Authors postulate that specialization can be increased in a community. In such cases (high level of specialization) the independent inventor can outperform corporate inventors, and thus become lead users. Authors conclude by stating that highly specialized users can play a role as quasi-engineer and technology forecaster for firms. Firms can find them in communities, implying that companies should join communities where these lead users reside. We observe, however, that this study was focused on technological settings and on inventions which result in a patent; we consider it improbable that only users that have patented a technological invention are qualified to participate in firm's innovation activities.

With regard to the question whether innovating users are professionals in the field of the product use, the findings of studies by Jeppesen and Frederiksen (2004;2006) show that innovating users are not likely to be professional users. Professionalism did not seem to have a relation to that of being an innovative user. On the basis of the results of these studies innovation appears to emerge from communities in which hobbyists make up the majority of users, of which those users that reported having innovated are likely to be of the type "lead users". Hence, users that comprise lead user characteristics will be more likely to innovate than 'ordinary' users in the same population (Jeppesen & Frederiksen, 2004;2006). Professional amateurs (also Pro-Ams or ProAms) is a conceptual term to describe a blurring between the separate distinctions of professional and amateur within any endeavor or attainable skill that could be labeled professional, whether it is in the field of writing, sports, computer programming, music, film, etc. The 20th century witnessed the rise of many new professionals in fields such as medicine, science, education and politics (Florida, 2002). Amateurs and their sometimes ramshackle organizations were driven out by people who knew what they were doing and had certificates to prove it. This historic shift is now reversing with Pro-Ams: people who pursue amateur activities to professional standards are increasingly an important part of the society and economy of developed nations. Their leisure is not passive but active and participatory (Tapscott & Williams, 2007). Their contribution involves the deployment of publicly accredited knowledge and skills, and is often built up over a long career involving sacrifices and frustrations. The term "professional amateur" has long had meaning and significance in any endeavor where a professional contingent exists. It is probably most recognizable in the field of sports, where those who play at highly competitive or skilled level, but are not paid, are often called Pro-Ams (Leadbeater & Miller, 2004). Pro-Ams occur in populations that have more leisure time and live longer, allowing the pursuit of hobbies and interests at a professional level. For example, authors of encyclopedia articles have traditionally been paid professionals, but recently amateurs have entered the field, participating in projects such as Wikipedia. Other Pro-Am fields include



astronomy, activism, surfing, software development, education, and music production and distribution. Open source/Free Software such as GNU/Linux was developed by paid professionals at companies such as Red Hat, HP and IBM together with Pro-Ams, and has become a major competitor to Microsoft.

The way Leadbetter and Miller describe Pro-ams, one might think that they are lead users. So, we could wonder whether the reported percentages of lead users, or better, innovators in the aforementioned studies (see 4.8) are accurate. In their study of an online community for computer-controlled music instruments Jeppesen and Frederiksen (2004) found that more than half of the users of the sample responded positively to the question; if they would like to make additional improvements to the products (54.8%), hence suggesting that there is a stronger wish to innovate than actually innovative behavior. As we have stated in our expose on user innovation, we suggested that these percentages can be much higher in reality, but that IP legislation could pose as a barrier for action to many users that want to innovate or modify existing products, thereby mitigating the reported percentages. The implication of this argument could be that there are many more possible innovators in the field than suspected. Hertel et al. (Hertel et al., 2003) found that the Linux OSS community also consisted of many users that do not exhibit lead user characteristics, yet they participate and contribute in the community. To their opinion, participation and contribution is mainly based on the Extended Klandermans Model (EKM) that explains voluntary action in social movements. The EKM-model tells us that the closer a person identifies with active subgroups of a social movement, the more he is willing to contribute personally (Klandermans, 1997; Simon et al., 1998).

The NPD process varies greatly between consumer goods and industrial goods. In the industrial goods sector, customers typically have a higher level of expertise regarding the product compared to those in consumer goods markets (Gruner & Homburg, 2000). But, this does not imply that customers are technology driven (Condit, 1994). In slow moving industrial markets, "average users" may provide satisfactory input to the development process (Gales & Mansour-Cole, 1995). Li & Bernoff observe that in using the groundswell to the firm's advantage, the firm does not need to make any distinction between B2B or B2C, as "business people are people too" (Li & Bernoff, 2008:70), supporting our viewpoint that sector still does not matter. We can therefore make the analogy with the Total Quality Management and also socio-technical premise that any employee is capable of generating creative ideas for work processes (Imai, 1990): any customer is capable of contributing to the innovation process, given the proper motivation and leadership.

Finally, lead users aren't necessary end users, a requirement we have stated previously. This is particularly demonstrated by Intrachooto (2004), where none of the of the sources of energy efficient innovations in buildings were building users or occupants, but rather architects, engineers, related consultants, and scientists, who had a historical background of working with each other or familiar with each other, as opposed to the lead user approach that assumes a group of strangers sharing their innovative ideas and trade secrets. The author concludes that some products, like buildings, airplanes, satellites, and such, are clearly not suited for lead user innovation, because there is no individual benefit or possibility for individual contributions. Nonetheless, the involvement of clients and building occupants has been found to enhance the likelihood of successful implementation of innovative technologies. Though rarely the source of ideas, clients' participation and support allow design teams to explore the unfamiliar technologies and thus they are vital to the development of the innovation (Intrachooto, 2004). Looking at practice, we may observe that Intrachooto is not exhaustive in identifying product categories where the lead user approach does not seem to work. Advertising aside, the key area in which customer-creation is supposed to deliver is in product development. Yet in reality, many of these projects are destined never to see actual manufacture. The Nokia Design Lounge, the Electrolux Design lab, Nespresso's Design Contest; all these

instances of supposed customer-creation are no more than conceptual showcases for aspiring and practicing designers. Companies have been running them for years. They may be a good way of recruiting talented stylists and engineers, but they've never been a serious part of product development.

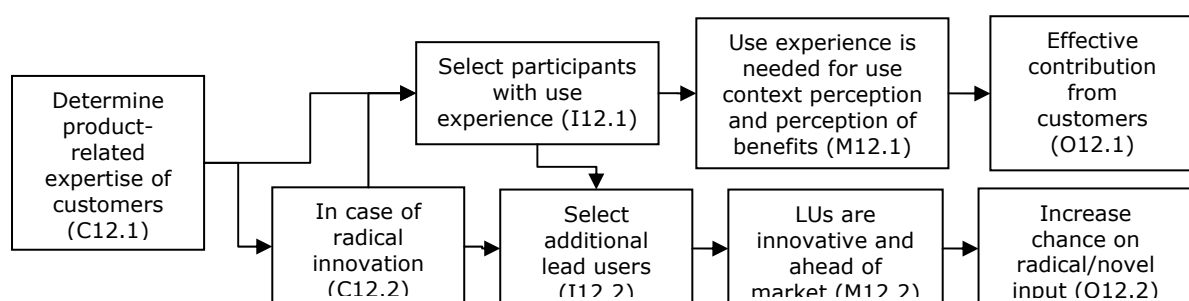
For the idea generation phase in radical innovations, users that are *inventors* are best suited to contribute (Lettl et al., 2006a). In their study two types of inventive users could be distinguished: (1) embedded into a context with close access to interdisciplinary know-how, like technological universities; and (2) resources for research were available (time, money, personnel) and a possession of a high amount of intrinsic motivation (hobby). These users did not match lead user characteristics, because problems they faced were faced by all users in the field.

In the testing phase for radical innovations, relying on conventional characteristics for the selection of test partners had a high failure rate of prototype tests (Lettl et al., 2006a). The profile of successful testers was: (1) users are motivated by an unsolved problem; (2) successful testers show a high level of experience in the user domain; (3) they exhibit a high innovation tolerance, i.e. openness for new technologies, willingness to the risks, and willingness to experiment. In addition, a geographical proximity to the innovating firm proved to be a critical contextual factor of successful prototype testing. Users that have been suitable testers of a radical innovation are not necessary in a position to play the role of inventors and/or developers in subsequent projects.

Finally, we want to address the results of some Swedish research in service innovation, that have evidenced that ordinary users can generate more and better ideas than professional developers (Kristensson et al., 2002; Magnusson et al., 2007; Magnusson et al., 2003; Matthing et al., 2006; Matthing et al., 2004). Experts generally solve problems more effectively than novices due to their well-structured and easily activated knowledge domain (Ward, 1994). But, if novices are using a much broader and unexpected search strategy, they may come up with ideas that are more creative and better than the experts' ideas (Magnusson et al., 2007). This is confirmed by a study by Wiley (1998), who found that novices or non-experts can outperform experts in conditions in which experts cannot make use of their domain knowledge, on tasks that require memory for the surface structure of presented information, and when a new task runs counter to highly proceduralized behavior. In innovation, solutions are required that may reside outside the search space or domain where experts have their advantage, emphasizing our emerging consideration that ordinary customers can be of as good help as professional innovators or lead users are. However, the contributions of ordinary users were nuanced in a later research (Magnusson, 2009). This study by Magnusson finds that the users' knowledge of the underlying technology has an effect on their propensity to contribute with incremental or radical new ideas. The ideas from guided users – i.e. users that were taught the underlying technology and its limitations – tend to be more incremental whereas the pioneering, i.e. unguided, users' ideas are more radical. But, contrary to the users in the guided user scenarios, the users in the pioneering user scenarios have a propensity to produce ideas that challenge the prevailing dominant logic of the company; these ideas can be used to assist the company to think in new trajectories, thereby defying the view that involving ordinary users in the innovation process hampers innovation because such users have an inferior knowledge of the underlying technical system (Bennett & Cooper, 1981). The study therefore proposes that ordinary users should not be expected to contribute ideas that can be directly put into the new product development process; rather, ordinary user involvement should be regarded as a process whereby a company learns about users' needs and is inspired to innovate. We will have to mitigate these findings by observing that the study was conducted in a high-technology industry, i.e. telecommunication service, and concerned the front end, i.e. the ideation phase of the innovation process.

We can conclude this discussion about requirements we have on the type of participants, that although literature suggests the involvement of lead users, since they are better capable of evaluating product features, technological aspects and possible benefits of a new product, and this in particular in the case of radical or breakthrough innovations, the concept of a lead user is not clearly and unambiguously defined, leading to several characteristics, which one could question on their uniqueness for lead users. In other words, many users, which are called 'ordinary users' can fit one or more of these characteristics. We have also reviewed literature that seems to falsify or contradict the proposition that only lead users are capable of contributing in innovations. On the other hand, literature (and practice) seems to confirm that no exceptional technical expertise or professionalism, i.e. being a professional in the product field, is required. We can finalize this discussion by stating that the amount of expertise of these participants is irrelevant – or in a better way: the less expertise they show, the better for their contribution in the front end - unless the firm is operating in high-technology setting and clearly aims at reaching a radical innovation, where it would be more appropriate to engage with lead users, or users that have some proven experience and expertise in the relevant or an analogue field. We thus propose:

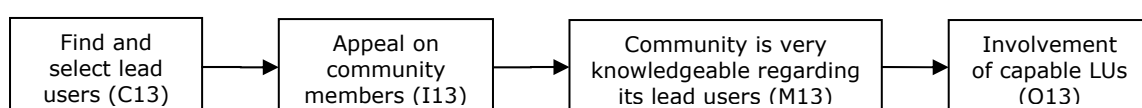
**Design Proposition # 12** *In determining the technical expertise for Customer Co-Creation in Innovations (C12.1), firms can involve any customer that uses, has used or will potentially use the innovation or a related product (category), regardless of their technology skills or know-how (I12.1), since all (potential) customers are sufficiently knowledgeable (M12.1) to effectively contribute to the innovation process (O12.1), whether they are lead users or ordinary users. In the case of radical innovations in high-technology industries (C12.2) firms might consider a certain additional representation of lead customers/users (I12.2) to increase the chance on a really novel or radical innovation (O12.2), since lead customers are considered innovative and ahead of the market in the field of innovation (M12.2).*



**Figure 8-2: Design Proposition # 12**

Furthermore, we can enhance Design Proposition # 12, where we argued that companies can involve an additional representation of lead users on top of ordinary users. To find these additional lead users we propose:

**Design Proposition # 13** *To find lead users in (online) customers communities (C13, O13), which can contribute in radical innovations (see Design Proposition # 12), the firm should observe and appeal on the whole community to identify motivated and capable participants (I13), since community members are knowledgeable about the community's lead users (M13).*



**Figure 8-3: Design Proposition # 13**

#### ***8.2.4 Psychological and social competences***

Although we do not require any technical skills or knowledge from participants, several psychological and social skills could be relevant. As we have seen in the previous subsection, several authors find in their studies that highly contributive users or innovators have an innovative personality (Morrison et al., 2004; Schreier & Prügl, 2008) or possess a high amount of intrinsic motivation, tolerance, willingness to take risks and experiment (Lettl et al., 2006a). Because the involvement implies participation in networking structures, it requires possession of coordinative skills which involve knowledge of how to coordinate activities, overcome cultural and social differences between partners, motivate partners, and sidestep potential conflict-generating situations (Etgar, 2008). Some practitioners claim that participants have to be able to articulate their needs (Smit, 2006). As we have demonstrated previously, the inability of people to articulate their precise needs can be overcome by using special elicitation techniques like the metaphor-based method and the outcome-based approach. A more important component in the arsenal of the skills is dialogical capability, defined as a process of learning together rather than just an exchange of information (Ballantyne & Varey, 2006). The chances of an effective contribution increase if the customers have good interpersonal skills and are amenable to work as part of a team (Pitta et al., 1996). Prahalad and Ramaswamy (2003) suggest that access to computer and electronic communications technology based skills are today crucial for dialogs with firms and other participants. Customers who are more skilled in such skills are therefore likely to engage in co-creation.

In a recent study supported by the Marketing Science Institute, Hoffman et al. (2009) argue that the best consumers to assist companies with innovation are those who exhibit 'emergent nature'. This can be defined as the unique capability to imagine or envision how concepts might be developed so that they will be successful in the mainstream marketplace. High-emergent consumers instinctively get what is attractive in a new product concept. At the same time they deconstruct and tweak a great idea to appeal to mainstream customers. Drawing on research on information-processing styles, Hoffman et al. developed measures of experiential and rational thought to identify consumers with strong abilities as both intuitive and logical thinkers. Consumers who are capable of such a synergistic style of thought also show strong traits of reflectiveness, creativity, openness to experience, and visual processing. The 'right' consumers thus tend to think experientially and are thus able to literally visualize creative uses of a new concept that intuitively 'look' right to them. But they don't stop there. Emergent nature consumers are also able to employ a rational thinking style in a logical and analytical effort to evaluate and refine the concept. It may be observed that the concept of emergent nature coincides with the lead user characteristics, whereas the latter emphasize the outcomes and the first the antecedents.

We will now look into a special characteristic that seems to receive consensus throughout innovation theory, namely creative capacity. Creativity is the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints) (Sternberg & Lubart, 1999). Creativity focuses on the generation of new ideas, regardless of how useful these new ideas might be in the short- or long-term (Chang, 2008), and does not necessarily imply innovativeness.

General theorists on creativity postulate that all people are creative in some way (Boden, 1990; Florida, 2002; Hirschman, 1980; Sanders & Stappers, 2008), regardless of gender, race, ethnicity, sexual orientation, education, profession or outward appearance. People formulate ideas based on their existing patterns of thinking. They think in ways they were taught to think. Their experience tends to conform the ideas they generate, inhibiting new types of ideas surfacing up. Most people search for solutions in the nearer context of the problem as they are led by already by what we previously named functional fixedness (Boden, 1990; Herstatt & Kalogerakis, 2005). The firm's own

employees are also exposed to this functional fixedness, placing constraints on their abilities to be creative. It is indicated that in order for employees to see old problems in new ways, generate fresh perspectives, and become free from their past experiences, firms should take some weird steps, such as recruiting people who are not blinded by preconceptions, encouraging employees to defy superiors and peers, and supporting risky projects with people whose ideas are not biased by past successes (Sutton, 2001). Knowledge brokering<sup>24</sup> (Hargadon & Sutton, 2000) is a way to deal with this, but in our view the involvement of firm impartial people like customers also meets Sutton's recommendations, although Verona et al. (2006) pledge for deploying both direct customer engagement and mediated or brokered engagement since this increases the diversity of ideas and the chance of reaching the right (potential) customers (Sawhney et al., 2003).

It is difficult for many people to believe that they are in fact creative and to behave accordingly. In the author's practice we have encountered many such situations where, e.g. ZMET™ interview participants perceive themselves at the start of the interview as not creative at all, while at the end they have reached a totally different viewpoint. Thinking monolithic about creativity – you either have, or you don't – , however, operates in itself as an inhibitor to being creative (Boden, 1990). Psychological research supports the notion that creativity doesn't require special abilities. It is an aspect of intelligence in general sense (Boden, 1990). Perkins (1981), for instance, asserts that creativity is based on common psychological abilities, like observation, memory, distinguishing interesting things, and the recognition of analogies. The difference between very creative and less creative people is not determined by abilities, but by the motivation to obtain greater knowledge, that manifests itself through greater skills and expertise (Boden, 1990; Chang, 2008). Several other studies indicate that individual creativity, especially the moment of insight itself, is based on the deeply social nature of their creative process. It is only by interacting with other people that makes people creative (Leonard & Sensiper, 1998). They also need to have some experience with the related problem – like being a user – to be capable to participate in any kind of co-creating activity with the firm. To support the firm's innovation process users have to be passionate about the outcomes they want, imaginative and visionary, insightful about their own use context, able to articulate their conditions of satisfaction and pragmatic and realistic about the need for viable win/win solutions (Seybold, 2006), implying that creativity alone is not sufficient.

So, anyone can be creative, but this will not come automatically. Asking someone to be creative will probably not work, but if you tell him how to do it, will help (Boden, 1990). Creativity can be stimulated by special techniques (Robertson, 1984). According to Amabile (1998) individuals can be 'excited' to become more creative through practices and conditions like the matching of the right people with the right assignments, giving people freedom to decide on the means, and providing sufficient resources to pursue creative ideas.

Sometimes users can play co-creating roles throughout the design process, i.e. become co-designers, but not always (Sanders & Stappers, 2008). It depends on their level of expertise, passion, and creativity – all people may be creative, but not all can become designers. A certain design attitude, encompassing several unique personal characteristics, is necessary (Michlewski, 2008). Fisher (2002) proposes that people can

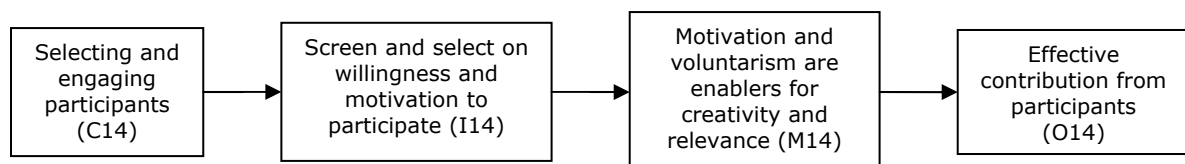
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<sup>24</sup> In this respect, Verona et al. (2006) and Sawhney et al. (2003) also distinguish virtual knowledge brokering or innomediation. Virtual knowledge brokers or innomediaries are the virtual manifestation of knowledge brokers – third parties who connect, recombine, and transfer knowledge to companies in order to facilitate innovation.

be projected on a creativity continuum ranging from passive consumer, through active consumer, end user, user, power user, domain designers, all the way to meta-designers. In relation to the use of products, Fischer advocates the emergence of adaptive design, in which the user could scale his involvement with a product from passive consumption to expert adapting. Sanders and Stappers (2008) believe that there are four levels of creativity in people's lives – doing, adapting, making and creating. These four levels vary in terms of the amount of expertise and interest needed – they grow with each level. People live simultaneously at all levels of creativity in different parts of their daily lives. This could mean that seemingly ordinary people can take on the role of co-designer in certain use fields.

We can conclude this sub-section by the observation that no exceptional skills or competences are required to participate in the company's innovation process, except for the ability of people to express themselves (Florida, 2002), have an interest in solving a problem with and for the company, are willing to participate and willing to be motivated by the firm (Leonard, 1999; Pitta & Franzak, 1996). On the other hand, the company can increase contribution, especially creativity, by providing clear instructions, asking the right questions, and stimulating interest and curiosity to participate. So, we will be mostly looking for volunteers and people that are motivated by the problem or otherwise intrinsically, and not by (monetary) rewards.

**Design Proposition # 14** *In selecting and engaging the participants to participate in Customer Co-Creation in Innovations (C14), companies can increase the effectiveness of their contributions (O14) by screening and selecting potential participants on their motivation and willingness to participate (I14) because intrinsically motivated and voluntary participants are capable of more creative and relevant contributions than others (M14).*



**Figure 8-4: Design Proposition # 14**

Another proponent of the We-paradigm is Csikszentmihalyi (1988;1999), who proposed the connection in the creative production between a person (with his/her genetic pool and personal experiences), a field (social system) and a domain (system, symbols, related to the idea of culture). Furthermore, Csikszentmihalyi (1988) repeatedly stressed the contextual and generative nature of creativity. This means that creativity is explicitly considered as embedded within a social and historical milieu and that every act of creation must start from and builds upon the existing knowledge within a domain. This, as much, explains that people can be creative in certain contexts (e.g. communities of interest or practice), while being uncreative in other contexts.

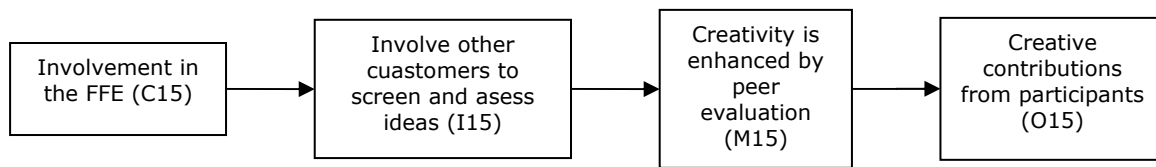
This opens a new world of opportunities for influencing creative behavior now conceptualized as less dependent on innate abilities and personality traits. A new artifact (idea, concept, product) is thus seen as emerging within the relation between the self (creator) and others (broadly understood as a community), all three being immersed into and in dialogue with an existing body of cultural artifacts, symbols and established norms (Glaveanu, 2010). This proposition is not structural but dynamic since it is in the tensions between all four elements that creativity takes shape with the new artifact becoming part of the existing culture (for oneself or community) and constantly alimentering the creative cycle. As Zittoun et al. (2003:441) suggest: "with the use of symbolic resources, there is always something produced, something externalized, which is attached to the producer

primarily by the gaze of the other". This implies the strong links between the creative outcome and the identity of the creator(s), as well as the role of the other in constructing this identity. At the same time, creativity could not exist outside of our relation with other people within a cultural setting since every new artifact needs constant meaning-making processes that make sense of it and this becomes possible only by using what Bruner (1990) calls interpretative procedures. What is of importance is that these interpretations are always context-dependent (Montuori & Purser, 1995) and therefore there is no real or objective creativity, but one that is constructed within communities, in relation to authors and creative products. Another conclusion we can derive from the previous analysis is that creativity is a generative process; it is connected to previous knowledge and cultural repertoires and in dialogical relationship with the old and already-there. Any innovative idea or object never comes 'out of the blue', as often suggested. Creativity should not be considered as a dichotomy or polarity, as much psychological work does, but should be acknowledged as there is a continuum in creative expression (Glaveanu, 2010).

What we can learn from this is that creativity always takes place in a community and the creative outcome is generally of interest for multiple communities. A community is not understood only in its topographical sense or as a local social system; it necessarily requires the existence of communion, of close ties and the feeling of belongingness between its members and can describe different social realities, from small groups to organizations and larger social structures. Communities exist where they are felt and experienced as such (Jovchelovitch, 2007). Most importantly, communities support their own culture and it is in communities that people find not only the resources they need to create but also the "parameters" for making sense of the world (Jovchelovitch, 2007) and all its creative, new artifacts. This last suggestion has direct implications for assessing creativity. As repeatedly argued, "the creativity of an idea depends not just on the content of the idea but the way in which that idea is developed, presented and interpreted" (Bilton, 2007:6). The argument that "creativity is socially defined" (Nijstad & Paulus, 2003:339), gives even more impetus to social and cultural psychologists in showing that there would be no creativity without others to appreciate it as such. In fact, what this approach argues is that creativity is not inherent to artifacts or persons but it is socially attributed to them.

This elaboration on the social dependency of creativity supports the notion we have indicated in Design Proposition # 5, where we have proposed that the firm can benefit from user creativity that emerges in new ideas or product suggestions, when users and customers can freely experiment and interact with other users in a user community. Our review adds to this proposition that the firm should involve, if possible, all community members in the screening of user suggested ideas and proposals. This suggestion conforms with the idea to apply idea competitions as a means to encourage users to participate at an open innovation process, to inspire their creativity, and to increase the quality of the submissions (Piller & Walcher, 2006). A word of caution is, however, in place. Competition may both stimulate and inhibit creative work; its impact depends on the individual's interpretation (Runco, 2004).

**Design Proposition # 15** *When appealing on customer creativity in suggesting new product ideas or improvements (C15), firms should have other users and customers, which take part in the customer innovation community, to assist in the screening and assessment of the ideas (I15) in order to increase originality, novelty and creativity from the participants (O15), because creativity is highly determined by the social context it takes place in (M15).*



**Figure 8-5: Design Proposition # 15**

### ***8.2.5 Educating the participant***

Although someone is highly educated this does not mean that he possesses specific knowledge and experience to perform the job (den Hertog & Huizenga, 2000). Access to a variety of skills linked to the specific tasks at hand and defined as expertise capacity (Lusch et al., 1992) or customer efficiency (Xue & Harker, 2002) can facilitate the involvement. If potential participants perceive themselves to be capable in a particular situation, they are more likely to help, and the help is more likely to be effective (Price et al., 1995). Prahalad and Ramaswamy (2003) propose that many skills improve through a process of evolvability, namely by repeated use, indicating the importance of experience in developing such skills. For instance, the potential to be creative may have some domain general elements, but to gain the knowledge one needs to make creative contributions, one must develop knowledge and skills within a particular domain in which one is to make one's creative contribution (Sternberg & Lubart, 1999). We also have some evidence from recent studies that high levels of intrinsic and high levels of extrinsic motivation can be made to temporarily coexist through training and experimentally-induced situational factors-with very positive effects on creativity (Hennessey et al., 1989). They found that the motivationally-trained children scored significantly higher on a scale of intrinsic motivation toward learning. They also found that the untrained children who were offered the reward produced less creative work than untrained children not offered the reward. By contrast, the trained children who were offered the reward produced more creative work than the trained children who were not offered the reward. It appears that the training altered the fashion in which intrinsic and extrinsic motivation interacted. Instead of detracting from creative performance, the extrinsic motivator added to it-but only for those children whose intrinsic motivation had been bolstered. (Amabile, 1993). To the extent that training sessions induce positive affect, they may be effective in raising levels of intrinsic motivation (Hennessey et al., 1989). Another support for training in creativity involves the notion that knowledge in creativity requires tactics, for these rely on procedural knowledge (Runco, 2004). Tactics are often used to solve important problems. Tactics are among the most teachable aspects of creative thinking.

Many people consider themselves to be "an idea a minute" generator. As they go through life, they spin off literally hundreds of ideas. However, a creative insight is not a matter of a quick 'aha!', but instead protracted; people should take their time if they want a creative idea or solution (Runco, 2004). Some people even think of making a profession of just generating good ideas and selling them to big companies. These are not the kind of people a company should be looking for, since the person seems to be only interested in selling his idea, instead of investing a great deal of his time and effort in bringing the idea to market. Some people may not be good at generating ideas, but they surely can judge an idea when it's presented to them. It seems that, when it comes to judging ideas, everybody is an expert. (Ries & Trout, 1991). This indicates that involving customers in innovations doesn't necessarily imply them to be 'idea generators'. They can be useful as well for screening ideas. But then, not everybody evaluates new ideas in a same way. They might use different criteria, some objective, some subjective ones. If it is possible, however, to get everyone on the same level, this would improve the decision process of the participants. It seems to be only a matter of handing people the right criteria to judge ideas, which probably has to be done in advance by means of training.



Training in divergent thinking strategies is a way to get individuals to think freely and become more creative (Chang, 2008). Training can cultivate the methodologies with which the new ideas are generated. Training is also helpful to minimize the constraining effects of past experience and procedures known to inhibit 'out of the box' thinking, thus improving the propensity in coming up with new ideas. Michalko (1998) recommends several thinking strategies that can be taught to any employee, and in our case, customer.

From the summary of the conclusion of documents on the customer as co-creator/co-producer, we can tell that if companies hope to utilize users' own knowledge to be fully responsible for product design and development, companies must be willing to assume the role of teacher and educate their customers as though they were training their employees (Kelley et al., 1990). Customers who are more skilled are more likely to engage in the co-creation (Dahl & Moreau, 2007). The role of the customer in NSD and NPD must be made clear to the customer, and if necessary, the customer may need to be trained (Johne & Storey, 1998). As we will see later on, an option is to 'partially employ' participants, which exposes the participants to the company's NPD-team. Training in interpersonal and team activities then becomes important (Mills et al., 1983). Training in basic work activities provides a foundation for the customer-employee to make an effective contribution (Lovelock & Young, 1979). Users also must be willing to invest a sufficient amount of time and resources to be able to become related technology experts. From this point, we know that both producers and customers must make more effort than before. Therefore, how to educate and encourage customers to be willing to participate in co-creation is the challenge the company must face (Chan & Lee, 2004).

Kambil et al. (1999) pointed out that it is not easy to utilize customers' knowledge. At least, in order to overcome the difference in the goals of both parties, both parties must consider what they want to obtain from the cooperative relationship and what the corresponding return they want to get is. Sawhney & Prandelli (2000) further pointed out that if the reason why the co-creation of knowledge cannot proceed is the customers' lack of learning capability, lack of trust of businesses, and lack of motivation to create knowledge, the resolution will be to invest in developing a language for both parties to communicate or to increase technological connectivity between businesses and consumers. Thomke and von Hippel (2002) talked about the toolkits for consumer innovation that increase the dialogue on the construction virtual space. Both may reduce the required time and effort that customers have to spend on obtaining business knowledge and sharing knowledge, further help customers to understand the implemented knowledge, increase customers' willingness to share knowledge with businesses, and improve the quality of customers' knowledge (Chan & Lee, 2004). In order to effectively utilize customers' knowledge, most manufacturers will provide members in the community with education and training, development tools, seminars, and rewards, treat customers like the company's employees, expect customers to develop the products they need or develop supplementary products that are appropriate for the company, hope to stimulate and accelerate the innovation development of products through the interaction with communities, so communities may become the innovation engine of the company (Chan & Lee, 2004). Adidas discovered in the development and operational use of miAdidas that customers found it difficult to choose from all options that were served in designing their shoes; people came with impossible or disgusting designs of their shoes. Adidas learned from this that customers have to be educated in using the online tool (Berger et al., 2005).

Finally, several studies (Kristensson et al., 2002; Magnusson et al., 2007) showed that educating participants in advance in different creativity techniques resulted in the participants generating more and better ideas than untrained participants, and even professional developers. However, training users in the understanding of the technology itself might become a burden against creativity. The knowledge creates rigidity in

thinking style (Kristensson et al., 2002). Heath and Heath (2007) relate the same experience and plead for training participants in process tools or techniques.

We see that training or educating the participating customer on three aspects, i.e. (inter)personal skills, process skills, and technology or tools that the firm use, can increase the likeliness of useful contributions. This training will give the participants additional belief in their own capabilities to perform the required tasks and contribute effectively (Vroom, 1967). We thus propose:

**Design Proposition # 16** *In selecting and engaging the participants to participate in Customer Co-Creation in Innovations (C16), companies can increase the quality of their contributions (O16) by giving participants some training related to the contributions that are expected from them, the tools and techniques to be used, and interpersonal skills (I16) since these will increase the participants' perception of their capabilities to contribute and inherently their intrinsic motivation and willingness to participate (M16).*

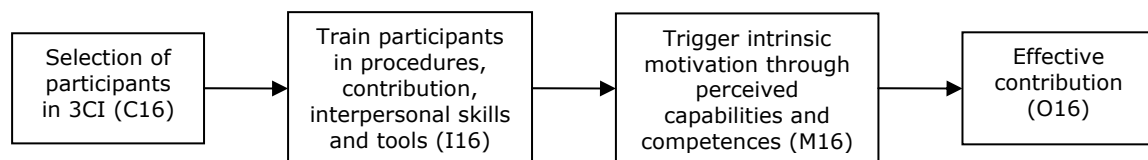


Figure 8-6: Design Proposition # 16

### 8.3 Number of participants

Our review of the modes of involvement show that the amount of participating customers can vary. In the cases of user innovation, lead users of the specific company are usually limited; it could be just one or a few at the most. On the other hand, crowdsourcing and mass customization modes are aimed at a large customer base or crowd, probably containing hundreds to thousands of potential participants. The manufacturer must ensure that he is plugged in to a representative sample of customers, otherwise his designs will have little general appeal (Gardiner & Rothwell, 1985). When there are one or two large customers (an OEM relationship), each customer may be represented directly. When the number of customers is large, several individuals may be chosen to represent the general population. In such a case it is important to look for diversity in opinions (Bonner & Walker, 2004), provided that participants are somehow knowledgeable about the problem (Surowiecki, 2004) – as we have depicted in our requirement to involve (potential) users. Moore (1987) found in his study in industrial companies that prototypes were tested with 4 to 12 customers. When a small number of firms were tested, no attempt was made to randomize their selection. Approaches of qualitative market research are more appropriate for the identification of innovating and demanding users. Qualitative surveys are very seldom based on representative samples. Participating users should not be selected via statistical but through problem-related criteria, known as *theoretical sampling*, where we seek for users who can help to describe and to understand a not well-explored phenomenon (Lüthje, 2004). Citing McCracken (1988:17) with the observation that qualitative research “does not survey this terrain, it mines it”, Arnould and Epp (2006) state that in qualitative research the conventional reasons for sampling do not apply. But, a large sample makes it less likely that we would fail to observe a behavior or record a perception that we would have wanted to know about. In other words, our objective when involving customers in innovations is to reduce the chances of discovery failure. In sum, an amount of 30 respondents is a reasonable starting point for the sample that can reveal the nearly full range of wanted data (Arnould & Epp, 2006). More user involvement is not necessarily better for user satisfaction. Heavy involvement may only be appropriate when uncertainty is high (Gales

& Mansour-Cole, 1995). There is a non-linear relationship between satisfaction and user involvement, first it increase, then it declines (Leonard-Barton & Sinha, 1993).

Nielsen (2000) developed a formula for discoveries as a function of the number of test users in the usability test related to interface design. He states that only small groups are needed to discover all usability problems of an interface. This is due to the fact people have similar behavioral patterns; hence the discoveries of different test users overlap. The experience suggests that it takes 5 users to discover 85% of the usability problems, and that this is sufficient to get back to the design board and update the product based on discoveries. In iterative design the feedback from the usability test is incorporated in the design and then tested again. Even though the redesign should have fixed the problems found in the first study, the truth is that the new design overcomes the problems. Nielsen proposes to have three iteration cycles, i.e. 15 users, to discover practically all usability problems of the design. Clearly the results are best when different users represent different demographic groups, and hence discover as many different problems as possible.

One main factor determining the amount of participants is the channel through which customers are involved: physical or virtual. Inviting participants to the office or a central location for meetings, and having face-to-face contacts with all participants clearly poses limits in the amount the company can handle simultaneously. Additionally, global participation requires traveling and venue arrangements, also limiting the number of participants. In contrast, virtual participation, which can take place asynchronously and global, almost make the amount of participants endless, for example a user community could consist of thousands of users. IBM involved in its 2006 Innovation Jam over 150,000 participants in more than 100 countries in just three days time, leading to over 46000 ideas (Bjelland & Wood, 2008). Kanter (1988) suggests the importance of casting a wide net by contacting large numbers of potential users. Contacts with a large set of users are more likely to provide developers with novel information and reduce uncertainty. Inherent to the use of present technology Tapscott and Williams (2007) emphasize the employment of many participants – mass collaboration – to guarantee many and continuous innovations. However, the costs of numerous relationships may be high, particularly due to an increased need for monitoring (Williamson, 1981). Another aspect of the physical participation factor is the time available for the innovation project. Obviously, the more time there is, the more customers can be involved. In the development of the flight deck for the 777 Boeing involved over 200 airline and certification pilots in two years time (Condit, 1994), while the lead user approach at 3M involves 10 to 15 participants in a period of a week or less (Lilien et al., 2002). Datar et al. (1996) found that receiving input from no more than 25 customers reduced time to market, but beyond that 25 level time to market performance degraded quickly at an increasing rate, due to the confusion created by many inputs and duplication of efforts.

Another aspect is about the type and quality of the contribution. Recent studies (Farooq et al., 2007; Hargadon & Bechky, 2006) emphasize the need to support group creativity instead of individual creativity. However, research on creativity and cognition has focused mostly on the moments of individual insight and has not adequately addressed the phenomenon at the collective level (Gentner & Markman, 1997; Sternberg & Lubart, 1999). According to Kurtzberg and Amabile (2001:285):

“although researchers have addressed brainstorming in groups with mixed findings, little is known about how creative minds interact in group processes.”

For this reason innovation in online communities is largely an unknown territory (Antikainen & Ahonen, 2007). In addition, from the level of customers' participation in each phase of product development, we can tell that the incorporation of customers is done mostly by utilizing various marketing techniques, to discover customers' needs,

regardless of whether the needs are well known/expressive or whether the level of needs is inexpressive. This condition is even more obvious in the design for customers and design with customers. In fact, customers rarely participate in the stage of the development of engineering technology. Even in the design by customer, which involves engineering development, (1) most of the time, customers are allowed to select among limited numbers of standard models and combinations. Customers have almost no room to utilize their creativity and to really innovate. It is just a concept of mass-customized production. It is still not common to allow customers to become innovators by providing them with sufficient freedom to create and to design innovative, customer created products that may truly satisfy their needs. (2) Even if customers are really allowed to become the companies' internal innovation partner, because of all kinds of limitations, normally only a small group of customers may participate and the participating customers have to pass through the filtering process performed by the company. Therefore, the number of participating customers cannot be expanded. (3) Customers participate only in a certain specific period of time during product development, and the participation is work-orientation. Therefore, customers and companies normally keep a structured relationship, a temporary relationship that will be dissolved just after the completion of the work. There are also very few interactions between customers (Chan & Lee, 2004). Furthermore, results showed that highly successful developers communicate with less functions of the lead customer organization than do less successful developers. They communicate with the same range of functions of the lead customer organization throughout the NSD process. Less successful developers increase the number of functions they communicate with as development progresses (Athanasopoulou & John, 2004). Lettl and Herstatt (2004) therefore argue that it seems to be appropriate to interact with a small, well selected number of users in early phases and to increase the number of involved users as the project gets closer to market introduction. Gales and Mansour-Cole (1995) also found that the frequency of user involvement and number of users contracted increased as projects progressed from idea generation to commercialization, and attribute this to the decreasing uncertainty as projects proceed. However, involving more customers does not automatically improve the usefulness of input; in fact, more input leads to a decline of usefulness (Constant et al., 1996). In that respect, when confronted with problem solving tasks diversity or heterogeneity (Page, 2007) seem to be more important, implying that if we employ a large amount of participants, the chance for reaching a diverse group increases (Surowiecki, 2004). On the other hand, 'hands-on tasks', like design reviews, prototype testing and usability tests are constrained by available prototypes or beta versions, often limiting the amount of possible participants. However, when going into the commercialization and finally into the use and re-innovation of the product or service, co-creation with customers resembles problem solving, making it necessary and timely to have a large and diverse amount of customer co-creators participate.

We see that the amount of participants may vary with the innovation process stage, taking a U-shape (Figure 8-7) when starting from conception and ending at re-innovation, with the maximum participants depending on organizational and information process capabilities, the chosen channel of involvement, and time available for involvement. As for the minimum amount during the implementation (design and development) stage, and the start of the commercialization stage this does not mean that we can suffice with just one, maybe two participants. We will want to get reliable and effective input from participants. In Voice of the Customer typically 20 to 30 participants are needed to obtain the 200 to 400 customer needs to develop an innovative product (Griffin & Hauser, 1993). In the lead user approach firms usually work with 10 to 15 lead users (Lilien et al., 2002), where lead user ideas, concepts or solutions are preferred by 75% or more of the other users in the market (Urban & von Hippel, 1988). For the ZMET™-approach 12 - 15 participants are needed to obtain all possible constructs (Christensen & Olson, 2002; Zaltman & Coulter, 1995), representing the Mind

of the Market (Zaltman, 2003). So, there seems to be some kind of consensus on a minimum of 15 participants.

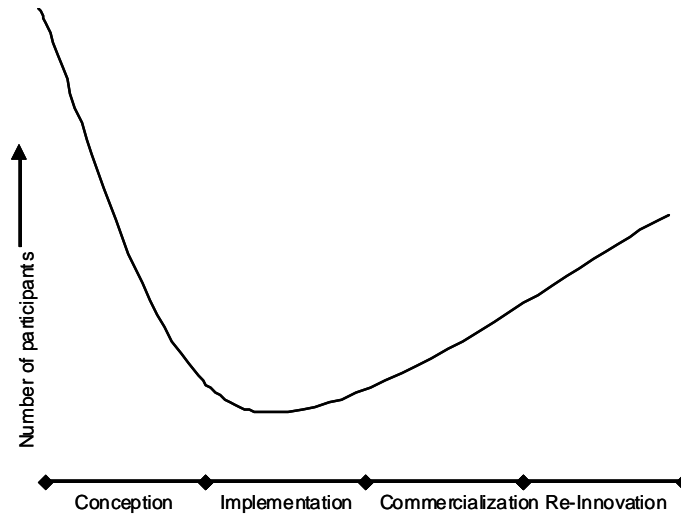


Figure 8-7: Relation between innovation stage and number of participants

Determining the exact amount of participants is a matter of costs, time, and convincement, the latter referring to the management that needs to be convinced that they have captured all customer inputs (Griffin & Hauser, 1993). In addition to these, saturation of data seems to be useful criterion. Of course, if the customer base is smaller than 15, this minimum criterion is useless: firms should then aim to involve all, or at least a good representation of these customers. We therefore propose:

**Design Proposition # 17** *In determining the amount of participants in Customer Co-Creation in Innovations (C17), firms should aim at involving a maximum amount of participants in the early (conception) and last (re-innovation) stages of the innovation process through online channels (crowdsourcing) (I17.1) because many and diverse input is needed in these stages (problem solving) but where the maximum amount is dependent of what the firm can handle, given the chosen strategy regarding time, channel and global reach (M17.1). During the implementation and start of the commercialization stage a minimum amount of participants should be aimed at 15 participants, preferably physically present, per phase (I17.2), since this amount assures a representative quantitative view of possible customer inputs and limits the resources (prototypes, test versions) needed (M17.2). This ensures an efficient contribution (O17).*

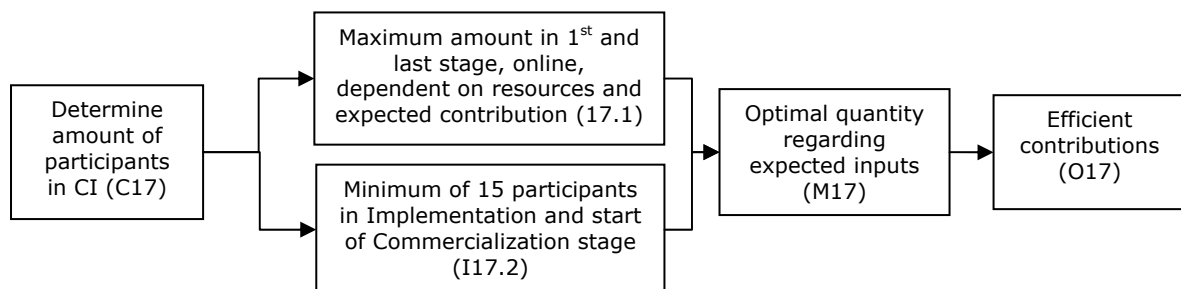


Figure 8-8: Design Proposition # 17

## 8.4 Engaging and maintaining involvement

### 8.4.1 Introduction

In this section we will look on ways for the firm to engage participation, to keep participants committed and have them make contributions.

### 8.4.2 Motivational issues in 3CI

In our review about customer co-creation modes in the previous chapter, we mentioned several examples which became a success. This suggests that customers are always inclined to accept a firm's invitation to participate and perform well on the task they are required to do. However, this is not always the case. Customers must be willing, able and interested to participate (Pitta & Franzak, 1996), where willingness can be achieved when the outcome is interesting to the customer – firms must therefore inform the participating customers about these outcomes and expected contribution (Cavaye, 1995), see Design Proposition # 7.

Alam (2006b) found that one major problem in customer co-creation in new service development was the lack of cooperation and commitment by the customers. Commitment seems to be a prerequisite for an effective customer co-creation (Ogawa & Piller, 2006; Ritter & Walter, 2003). *Commitment* is defined as "an implicit or explicit pledge of relational continuity between exchange partners" (Dwyer et al., 1987:19) or "an enduring desire to maintain a valued relationship" (Moorman et al., 1992:316). It implies a willingness on the part of both partners to make short-term sacrifices to realize long-term benefits in the relationship (Anderson & Weitz, 1992; Ritter & Walter, 2003). Commitment has been shown to influence behaviors such as spreading positive word of mouth (Brown et al., 2005), promoting or recommending brands (Verhoef, 2003), forgiving negative experiences (Fournier, 1998), and participating in marketing research or providing feedback (Aggarwal, 2004). Research shows that commitment comes from trust (Morgan & Hunt, 1994), giving us the insight that to create commitment, firms have to start to have trust from their customers. Trust itself, defined as the customer's overall perception towards the ability (i.e. skills and competencies of the firm), benevolence (i.e. the extent to which a trustee is perceived as being willing to take the other party's interests into account when making a decision), and integrity (i.e. the customer's belief that the firm is honest and fulfills its promises) of the firm (Mayer et al., 1995; Ritter & Walter, 2003), is a result of a firm's reputation (Doney & Cannon, 1997; Fombrun & Shanley, 1990; Keh & Xie, 2009). For example, Parkinson (1985) found that potential customers who had a satisfactory experience with the company in the past, were on average, relatively quicker to adopt the innovation than customers who had an adverse or no experience with the company. The more customers trust the company as a supplier on their side, the more information they will willingly give the company. If the company learns from that information and use it wisely for their benefit, then it will get the really important feedback that will engage the customers, win their advocacy and differentiate the firm from its competitors. As has been observed earlier, a full disclosure of the entire process is needed: collective customer commitment requires the integration of customers in an open innovation process (Ogawa & Piller, 2006). If product development is kept confidential, companies will find it impossible to keep developers and consumers on the same page. We will not elaborate on how reputation and trust are built by a firm but refer to relevant literature on the subject.

Alam (2006b) found that in a few cases customers did not fully commit themselves because of the lack of any tangible benefit to them. The first reward available to external participating customers is a solution to their problem (Pitta & Franzak, 1996), but this is not always a tangible result. Customers can therefore be protective or closed concerning their inventions or innovations (Rubenstein & Ettlie, 1979), or simply can't be trusted

concerning their commitment to participate in the innovation process (Esselman, 2006), often leading to an early withdrawal from the process or a low productivity because of a lack of knowledge what to do (Martin et al., 1999; Ramírez, 1999). Some customers are more prone to engage and stay committed in co-creation than others, the major reason being that co-creation requires the use of specific customers' operand and operant resources (Arnould et al., 2006). A major resource that customers use in co-creation and co-production is their time. While the amount of time used in each case depends on the tasks involved and the dexterity of the customers in the execution of the relevant tasks, time can still be a scarce resource for all individual and its use in co-creation reflects economic, social and psychological costs for the customers (Etgar, 2006). Therefore, more affluent customers with access to capital might be more willing to co-finance the activities than less affluent customers, and customers who enjoy more discretionary time will be more prone to engage in co-creation (Etgar, 2008).

### **Motivation and participation in online communities**

Since the competition is tight and relationships with online communities are easy to end, it is necessary to consider how customers can be motivated to visit and contribute in online communities (Mäkipää et al., 2006). Existing literature on the reasons or motivations of consumers to participate in online communities can be displayed as follows. Hagel and Armstrong (1997) focus on the economical benefits of the online communities and argue that participants gain interest, relationship, play fantasy games, make transactions, and many other needs simultaneously. Kollock (1999) has investigated the reasons to contribute and find that people anticipate for reciprocity – confirmed by Wang & Fesenmaier (2003) and Hall and Graham (2004), look for an increase of reputation, or achieving a sense of self-efficacy. McKenna and Bargh (1999) identify two types of motivations: (1) self-related ones like disclosure of secret aspects of self and becoming the ideal self; and (2) social related motivations, like avoiding social anxiety, loneliness, hectic lifestyle and safety issues, where it is the intention of the participant to gain intimacy, presenting the ideal self to gain approval and acceptance, and forming relationships. Bagozzi and Dholakia (2002) and Dholakia et al. (2004) built a social influence model, which consists of 3 parts: (1) individual motives for participation, (2) social influences on member participation and (3) social identity in the online community. Wasko and Faraj (2000) concentrated on the knowledge exchange between participants and the reasons why people help each others. They recognize three categories of returns that participants seek in online communities: (1) tangible returns, like access to information and expertise, personal gain and answers to specific questions, (2) intangible returns, referring to the intrinsic satisfaction and self-actualization, and community interests, pertaining to the value of exchanging practice related knowledge with like minded members. In their view people do not use the community to socialize, but for the before mentioned returns, whereas it is important to give back to the community in return for help. Kim (2000) uses Maslow's hierarchy of motivations (Maslow, 1968) to clarify the goals and needs of online community participants. Ridings and Gefen (2004) have investigated the reasons why people visit online communities and found that they do so to exchange information, for social support, friendship, recreation, common interest and technical reasons.

Wiertz and Ruyter (2007) studied motivations of collective action in firm-hosted commercial online communities and found in such communities the same mechanisms for motivation and commitment exist as in common on-line communities. In these communities customers interact to solve each other's service problems. They extend the model of social capital by Wasko and Faraj (2000) to include the impact of commitment to both the online community and the host firm and reciprocity on quality and quantity of knowledge contribution. They studied moderating influence of three individual attributes on contributions: perceived informational value, sportsmanship and online interaction propensity. They find that customer's online interaction propensity, commitment to the

community and the informational value perceived by customer in the community are the strongest drivers of knowledge contribution. Recently Harper et al. (2008) studied the predictors of answer quality on Question and Answer (Q&A) sites, such as Yahoo! Answers, on the Internet. Q&A sites are places, where users ask questions and other users answer them. Some of the sites are free and some are based on requiring a payment and paying a fee to the answerers. In their study they found that the answer quality was typically higher in fee-based sites than in free sites and paying more money led to better outcomes. They also found that site's community of users contributes to its success. In their study sites where anybody can contribute to answering outperformed sites with specific individuals answering the questions (Antikainen & Väättäjä, 2008).

A special form of an online community is the open source community, researched by von Hippel and von Krogh (2003) who found that personal learning and the enjoyment from programming are the main reasons to participate. Empirical research found that OSS-participants are motivated in three ways: (1) by the direct utility, either to the individual or to one's employer; (2) through intrinsic benefits from the work, such as learning a skill or personal fulfillment; and (3) by signaling one's capabilities to gain respect from one's peers or interest from prospective employers (Hertel et al., 2003; Lakhani & von Hippel, 2003; Lerner & Tirole, 2002). This seems to be consistent with the expectancy theory (Vroom, 1967).

Jeppesen and Frederiksen (2004) found no significant correlation between being an innovative users and being motivated by a wish for recognition from peers, as suggested by Lerner and Tirole (Lerner & Tirole, 2002). However, there was a relation between being an innovative user and the wish for recognition from the firm. First of all, this sort of finding would not be found in the open source software movement, as no firms are directly involved in the manner described in this paper. The finding is interesting in the sense that it opens up a new perspective for motivation in a setting where a firm is more openly involved in the evolvement of the community. Besides, it opens up a scope for management in terms of how the firm chose to provide valuable recognition. But the question remains, why is recognition from the firm so important to innovators? Jeppesen and Frederiksen believe that innovative user may have career concerns and entrepreneurial visions, which are more likely to come true if the user innovator have been acknowledged individually by the firm in front of a crowd of fellow product users. However, reputation need not come directly from the firm – recognition from a respected user, which has already a good reputation in the firm domain, can be valuable exactly because of this user's status as reputed by the firm. In this sense reputation is interpreted as a transitive element. However as they did find no evidence of peer recognition being important to innovative users, they believe that users may perceive direct recognition from the firm, which is visible to other users, as the most effective source of reaching higher-level status as innovator. In other words the firm is "the mother of reputation" in front of whom "career concerned" users will like to show off their innovations, get recognition and become reputed among peers for having achieved firm recognition.

Nov (2007) has studied content contributors of Wikipedia to find out what motivates them to offer their time and talent in return for no monetary reward. Motivations associated with high or low levels of contribution were also studied. Clary et al. (1998) identified six motivational categories of volunteering behavior: (1) value expression; (2) social relationships with others; (3) understanding through new learning experience; (4) obtaining career benefits; (5) protection from negative feelings; and (6) enhancement of one's ego. Nov's study included these and also two categories from open source software development, namely fun and ideology. Social relationship, career benefits and enhancement of ego were not found to be strong motivations for contribution in Nov's study. Surprisingly, contribution level was not significantly correlated with ideology and



social motivations, which indicates the conflict with people's statements and actual actions (Antikainen & Väättäjä, 2008).

### ***8.4.3 Motivating participation through expected benefits***

An implication would be that we have to reward participants to prevent them from abandoning the project before their 'job' is done. But are participants only motivated by promised and expected rewards? We will address this question on how to motivate participants to stay involved in this section.

To do so, we have to make use of work motivation theories (Bowen, 1986; Ives & Olson, 1984). Research in both the psychology and the business literatures over the past four decades has documented that motivation varies as a function of several factors in the work environment, including evaluation expectation, actual performance feedback, reward, autonomy, and the nature of the work itself. The theory and empirical research motivation also have suggested that human motivation toward work can be categorized into two distinct types: intrinsic motivation, which arises from the intrinsic value of the work for the individual (such as its interest value), and extrinsic motivation, which arises from the desire to obtain some outcomes (such as rewards) that are apart from the work itself. If the reasons have to do with the task as a means to positive, skill-exercising experience or self-expression, then we say that the individual is intrinsically motivated. If the reasons have to do with the task as a means to some external end, then we say that the individual is extrinsically motivated. Intrinsic motivators are an endogenous part of a person's engagement in the activity; they arise from the person's feelings about the activity, and they are necessarily bound up with the work itself. Extrinsic motivators, although they may be contingent on the work (like pay for performance) are not a logically inherent part of the work. Extrinsic motivators include anything coming from an outside source that is intended to control (or can be perceived as controlling, e.g. Dahl & Moreau 2007 ) the initiation or performance of the work, for example: promised reward, praise, critical feedback, deadlines, surveillance, or specifications on how the work is to be done. Although they can both motivate people to do their work, intrinsic and extrinsic motivation can have very different effects on subjective feelings about the work, eagerness to do the work, and the quality of performance (Amabile, 1993). Research shows that many users that participate in co-creation do this primarily for intrinsic reasons (self efficacy, recognition) rather than for monetary rewards (Franke & Shah, 2003; Füller & Bartl, 2007; Jeppesen & Frederiksen, 2004). The first reward that external participants get is a solution to their problem, which may translate into personal satisfaction, better job or social performance and recognition from their work or social environment (Dahl & Moreau, 2007; Ljungberg, 2000; Pitta et al., 1996). The Pro-Ams described by Leadbeater and Miller (2004) as well as Florida's Creative Class (Florida, 2002) also show that it is not about money, but mainly for the love of doing it.

Deci and his colleagues propose that intrinsic motivation arises when individuals feel both self-determined and competent in their work (Deci, 1971; Deci & Ryan, 1985). Deci also suggests that self-determination and competence cannot work to produce intrinsic motivation unless the target task is interesting in some degree; such interest might arise from skill variety, task identity, and task significance. We encounter more research confirming these findings, e.g. in the Expectancy Theory, teaching us that people's motivation to perform certain tasks or to strive for goals in organizations is dependent on the task relevance, the attractiveness and specificity of the expected outcomes, as well as the difficulty to achieve them (Herzberg, 1966; Locke, 1968; McClelland, 1961; Tubbs, 1986; Vroom, 1967). The more complex, difficult or challenging a task is, the more attractive it will be for someone to achieve, and the better the result will be. In a similar way, the more specific the task goal is, the better the performance will be (Tubbs, 1986). Kittur et al. (2008) studied Amazon's community for micro-task markets called Mechanical Turk where small tasks can be assigned to the large community of users. The

community offers a potential paradigm for engaging a large number of users for low time and small monetary costs. Since the tasks in Mechanical Turk are often very simple and do not demand creativity, it can be assumed that one of the main motivators to contribute is money. They concluded that in aim to gain quality answers it is important to formulate tasks carefully.

McKeen et al. (1994) found in their study on co-production that the strength of the participation-satisfaction relationship depended on the level of the factors task complexity and system complexity. That is, in projects where there was a high level of task complexity or system complexity, the relationship between user participation and user satisfaction was significantly stronger than in projects where task complexity or system complexity was low. Task complexity relates to the level of the user's understanding of the task and system complexity relates to the developer's level of understanding of the development project. Etgar (2008) proposes that, in order to achieve effective customer involvement, the related product or service has to be customizable and important to customers, because these motivate participation. Although these observations apply to co-production of products and services, we think it is plausible to 'extrapolate' these findings to the process of co-creation, i.e. customer co-creation in innovation. Both McKeen et al.'s and Etgar's findings are supported by Nambisan & Baron (2007) and Florida (2002), but in a value creation and innovation context. A study by Ling et al. (2005) in mechanisms to motivate online community participants to contribute showed that, as predicted by social psychology theory, individuals contributed when they were reminded of their uniqueness and when they were given specific and challenging goals.

Goal setting theory, a robust theory of motivation in social psychology, has shown that assigning people challenging, specific goals causes them to achieve more (Locke & Latham, 2002). Many studies have shown that specific, challenging goals stimulate higher achievement than easy or "do your best" goals. High-challenge assigned goals energize performance in three ways (Bandura, 1995). First, they lead people to set higher personal goals, in turn increasing their effort. Second, assigned goals enhance self-efficacy, or belief in one's own ability to complete a task. Third, achieving an assigned goal leads to task satisfaction, which enhances both self-efficacy and commitment to future goals, resulting in an upward performance spiral. The theory claims that difficult, specific, context-appropriate, and immediate goals, rather than long-term goals, motivate people most, and that they do so especially in tasks that are simple and non-interdependent and give them feedback on their performance against the goal.

From this and the basic theoretical view on intrinsic motivation we can derive that customers will probably show more dedication in their participation when their tasks and/or the product involved are relatively complex, challenging and difficult (Kanter, 2001), and the task and its goals are specified (Schneider & Bowen, 1995). As experienced with socio-technical systems design an important condition for the design delineates that the fragmented 'direct' tasks and 'indirect' controlling tasks should be integrated into meaningful larger tasks, an option called the strategy of "simple organizations and complex jobs" (de Sitter et al., 1997:498). Similarly, we can project this approach on the tasking of customer when involved in the innovation process, because it results in less support activities by the company staff, less bureaucracy, and better performance by participants. In this respect, complexity does not refer the way the task is formulated and communicated (de Bono, 1998), but to its execution. This will increase the chance for success or decrease the chance of premature disengagement or project abandon.

**Design Proposition # 18**      *For firms that need to engage and motivate participation (C18) and ensure commitment throughout participation (O18), the assigned task for the participating customers has to be meaningful, challenging and relatively complex to them*

(I18.1), while its goals should be clearly specified (I18.2). By means of knowing what is expected from them (Design Proposition # 7) and the feeling of being in control (Design Proposition # 4) participating customers can assess the relevant valence emerging from their efforts, which is needed to feel motivated to perform (M18).

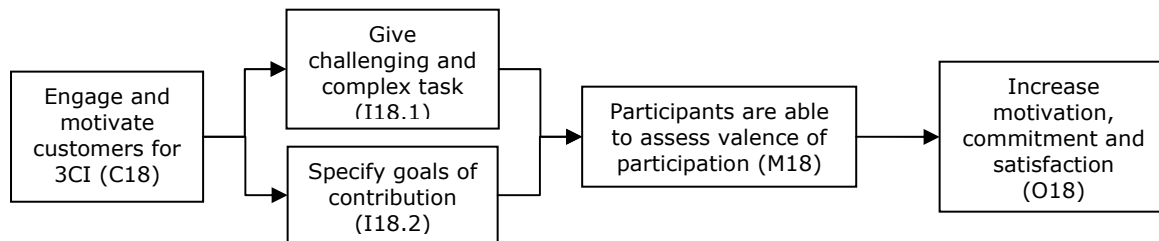


Figure 8-9: Design Proposition #18

#### 8.4.4 Rewarding participation

Motivating individuals to generate and contribute their IP in the absence of financial returns is a significant management challenge for an Open Innovation approach (O'Mahony, 2003; West & Gallagher, 2006b). In mass customization customers can define much of the features and appearance of the products through different kinds of configuration tools. When they learn to use these tools and get accustomed to have power to change product features, customers become even more demanding. Some consumers even want their cut of the firm's business (Antikainen et al., 2006). In the path of interactive value creation, the companies have actually already taken a step further by paying customers for their contribution. Rewarding customers for their contribution is an interesting phenomenon as it opens new possibilities for companies, as can be seen with Threadless, Crowdsprite, Spreadshirt and Cafepress (Antikainen et al., 2006). Some online communities, especially intermediaries (for example as Crowdsprite and FellowForce) are giving monetary rewards to innovators (Antikainen & Ahonen, 2007). One of the interesting perspectives is provided from the viewpoint of OSS (open source software) communities where people are working on a voluntary basis without receiving direct compensation. Although some of the participants are receiving their salaries from the companies, the basic idea of OSS has been traditionally based on free work and still often is. But, why do firms employ them and pay them salaries? However, there are some conflicting results concerning motivation and monetary rewards. Caution is needed when applying performance-based financial rewards; experiences with this kind of reward are rather negative than positive (den Hertog & Huizenga, 2000). Therefore, it is called into a question, whether members see monetary rewards as motivation factors. We will look into the effects of rewards on participation in this sub-section.

The predominant psychological view proposes that in most cases extrinsic motivation works in opposition to intrinsic motivation (Deci, 1971; Deci & Ryan, 1985; Lepper & Greene, 1978; Lepper et al., 1973). Extrinsic motivation arises when individuals feel driven by something outside of the work itself, such as promised rewards or expected evaluations. Generally, these theorists propose that, when strong extrinsic motivators are placed on task engagement, intrinsic motivation to do that task will decline, because these external rewards are perceived as a controller of one's autonomy rather than recognition of one's competences. This is known as the *overjustification effect* – people who work on an interesting task in order to obtain a reward demonstrate lower subsequent intrinsic motivation than people not working for reward (Hennessey et al., 1989) – and has been demonstrated across the entire age span-from preschoolers to college students to adults in the workplace (Deci, 1971; Lepper et al., 1973; Tang & Hall, 1995). The evidence for this effect seems overwhelming (Hennessey et al., 1989).

Amabile (1993), however, argues that it is likely that both intrinsic and extrinsic motivators are present for most tasks that people do in their work. This is confirmed, where, contrary to experimental findings on the negative impact of extrinsic rewards on intrinsic motivations (Deci et al., 1999), it was found that being paid and feeling creative on OSS projects do not have a significant negative impact on project effort (Antikainen & Väättäjä, 2008). It appears to be entirely possible for people to be motivated by, for example, both money and personal challenge in their work. Because the two motivational types so often co-occur, it is especially important to consider how they might combine and interact.

In the light of the rewarding models used in successful open innovation intermediaries, like InnoCentive, it seems reasonable to assume that multiple and varying types of motivations are present and members may also have multiple simultaneous goals behind their participation. It appears that both intrinsic and extrinsic motivation can appear in both a temporary state form, which is affected by the environment, and a more stable personality trait form, which is relatively consistent across time and across situations (Amabile, 1993). So, there is both stability and change in intrinsic and extrinsic motivation. Although people may be more or less consistently oriented toward intrinsic and/or extrinsic motivators, the motivational states of most people can be temporarily affected by the presence of salient extrinsic motivators and by the nature of the work. In other words, instead of focusing on either the work environment or individuals as the locus of motivation, we must include both. Hars and Ou (2002) divided OSS members' motivations into two broad categories: internal factors (e.g., intrinsic motivation, altruism) and external rewards (e.g., expected future returns, personal needs). Lakhani and Wolf (2005) studied participants in F/OSS communities and their study indicated that paid contributors dedicated significantly more time (51%) to projects than volunteers. Furthermore, contrary to experimental findings on the negative impact of extrinsic rewards on intrinsic motivations (Deci et al., 1999), Lakhani and Wolf found that being paid and feeling creative on F/OSS projects does not have a significant negative impact on project effort (Antikainen & Väättäjä, 2008). But, on the other hand, saliency of this reward may have negative effects on the decision and behavior of non-involved customers, as is shown by the case of PayPerPost that pays bloggers to create word of mouth (WOM) for its customers, and that backfired because customers distrusted company paid buzzers (Hunt, 2009).

Amabile (1993) thus found that certain types of reward, recognition, external control, and feedback do not necessarily undermine intrinsic motivation and may actually enhance some aspects of performance. On the other hand, it appears that constraint on how work can be done, as well as other types of reward, recognition, external control, and feedback, will be detrimental to intrinsic motivation and performance. Any extrinsic factors that support one's sense of competence without undermining one's sense of self-determination should positively contribute to intrinsic motivation. We can think of these as "synergistic extrinsic motivators." In addition, extrinsic motivators that serve directly to increase one's involvement in the work it self should also operate in service of intrinsic motivation. By contrast, there are some "non-synergistic extrinsic motivators" that may never combine positively with intrinsic motivation, because they undermine one's sense of self-determination without adding to feelings of competence or deep-level involvement in the work. Stringent controls over the conduct of one's work should have such effects, as should any rewards, recognition, or evaluation systems that lead people to feel controlled by powerful others. Thus, monetary reward itself does not necessarily undermine intrinsic motivation and creativity. But reward that signifies or is accompanied by constraint can have serious detrimental effects.

In a later study Deci et al. (1999) examine the effects of extrinsic rewards on intrinsic motivation. In what they call the Cognitive Evaluation Theory (CET), the effect of tangible rewards depends on whether the reward was expected or not. If the reward is not

expected, intrinsic motivation for working on a task is not affected. But, when the reward is expected, it depends on how the reward is contingent on task or performance. When the reward is only given when one engages in the task or when the task is completed, this will undermine intrinsic motivation, because the reward is perceived as controlling one's behavior, and not recognizing one's competence well enough to offset the negative feeling of being controlled (Cameron & Pierce, 1994; Deci et al., 1999; Eisenberger & Cameron, 1996; Rummel & Feinberg, 1988; Tang & Hall, 1995; Wiersma, 1992). In contrast, if the expected reward is given when the performance is good, the reward can also convey substantial positive competence information, offsetting the negative controlling effect of the reward on intrinsic motivation. When the expected reward is administered task not contingent, i.e. regardless whether one even starts, completes the task or perform well, there will be no reason that it is controlling or competence informational, meaning that intrinsic motivation is not affected by the reward. Although theoretically different, the self-perception theory (Bem, 1972) that has been extended by Lepper et al. (1973), comes to a similar result. In this theory, people are said to make post-behavioral attributions about the causes of their own behavior based on considerations of the behavior and the conditions within which it occurred. When people are rewarded for doing an interesting activity, they are likely to attribute their behavior to the reward and thus discount their post behavior intrinsic motivation that is lower than it would be if they had not gotten the reward. This is called the overjustification effect of rewards. In sum, to engage customers in the innovation tasks, rewards are better not promised in advance, or should be made contingent on performance, not on participation. But one must be mindful that people may begin to expect the 'unexpected' rewards, if they are given on a regular basis. Additionally, administering performance-contingent rewards will lead to a substantial undermining of free choice intrinsic motivation for people who underperform and therefore receive less than the maximum reward. The failure is then experienced as a negative feedback, on top of the negative controlling effect of the reward (Deci et al., 1999). We must be aware, however, that the aforementioned findings from Deci et al. refer to tangible rewards. In general, tangible rewards always have a significant negative effect on intrinsic motivation for interesting tasks, even though people still report that in cases of performance-contingent rewards, the reward did not affect self-reported interest (Deci et al., 1999). Administering non-tangible rewards, like verbal ones, have a significant positive effect on intrinsic motivation.

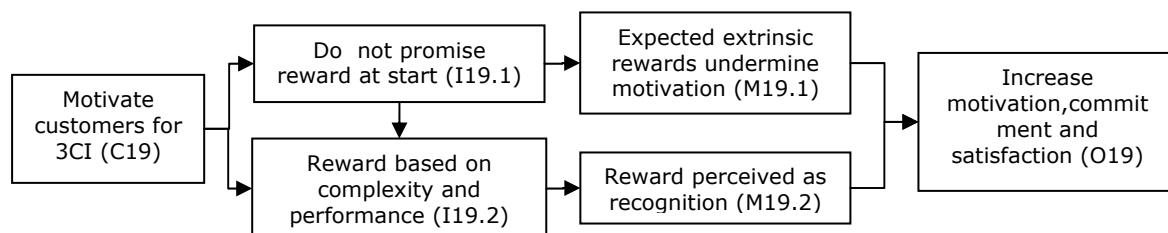
What extrinsic motivators except for tangible ones should be used? Lüthje (2004) suggest that receiving a financial reward can motivate users to innovate and even decide to license or to market their inventions. Typically, most people assume that it the most important extrinsic motivator is the financial reward. The term "incentives" (Reeve, 2005) is therefore a more appropriate term, since it entails a combination of both monetary and non-monetary rewards. Examples of incentives are approval, paychecks, trophies, money, praise, attention, grades, scholarships, prizes, food, awards, honor-roll lists, public recognition and privileges. Companies that want to keep the ideas flowing must provide concrete incentives to their contributors. As we can see these strategies can be applied in both business and consumer settings. For B2B collaborations with customers, Pisano and Verganti (2008) propose nonfinancial rewards like high visibility in the job market, and an enhanced reputation among a peer group. There are no hard rules about which incentives work best with particular forms of collaboration. Although people often associate psychological fulfillment with innovation communities, it can be a powerful incentive in the other modes as well. For example, Alessi not only shares royalties from sales with the designers in its elite circle but also includes their names in product marketing and offers them a high degree of freedom in the design process (Pisano & Verganti, 2008). In order to motivate active participation in online environments incentives offered should match the values of the group in question (Hall & Graham, 2004).

Five strategies that can help are suggested by von Krogh (2006): (1) Show preemptive generosity, offer free trials or samples of the product that incorporates their ideas, or award prizes for the best customer inventions. Where contributions are more significant, consider exchanging some IP for customer engagement (open source); (2) Create customer communities, using the mechanism that customers gain by learning from another. Customers will benefit immediately from the suggestions of their peers, while the firm can pick up new ideas; (3) Leverage the firm's brand, because customers who love the brand want to be associated with it. Celebrate their involvement by publishing their names and contributions on the firm's website. The firm might even co-brand products with some customers, whose own brands would benefit from having contributed IP to the firm; (4) Encourage customers to set up shop, making it possible for them to create their own businesses from engagement with the firm's products; and (5) Pay them. Of course, companies can also simply ask their customers, "What will it take to keep those great ideas coming?" In fact, the next fruitful target for co-creation may be strategies for parceling out co-creation's rewards (von Krogh, 2006). Of course, incentives might have to evolve if co-creation reached the limits of individual 'volunteerism'. Communities could, for instance, start paying participants for their contributions or actively promote their reputations outside the community – say, in marketing campaigns (Bughin et al., 2008). Antikainen and Väättäjä (2008) investigated the importance and ways of rewarding in 3 intermediary communities, where they interviewed maintainers of the community as well as members and participants. The maintainers agreed that combination of monetary and non-monetary rewarding seems to be the best way to reward and motivate members to contribute into ideation and innovation process. It was also said that the bigger and more demanding the task is, the bigger the reward should be. The surveys with members also show that rewarding definitely has an essential role for the respondents of our survey. The survey results indicate that monetary rewarding is important as well as recognition according to the quality of ideas. Members also appreciate that rewarded members are announced on the web site. It seems natural that people want to get paid for their time and effort. A lot of research has been done on open innovation and user innovation (Jeppesen & Frederiksen, 2006; von Hippel, 2005) on peer-to-peer communities and also to companies on firm-hosted communities. However, these communities are often based on certain type of enthusiasm, hobbyism or even are brand-related. It seems that users' behavior is not similar in cases when an open innovation community is run by an intermediary, whose business model is based on the members of the community ideating or innovating and revealing their ideas to challenges given by external companies.

With respect to customer co-creation in the commercialization stage, e.g. for advertising and WOM, care has to be taken. There are rules that forbid companies from writing their own reviews or fraudulent reviews. When people read something from others, they assume that it comes from a real person, that he is not falsely representing himself or the product, that there is no bias, and that it is true authentic voice of another customer. This means that companies that pay bloggers to post stories about the company and do not disclose that the bloggers are being paid, are misleading others. If someone should read the blog, he will assume that the bloggers are just random people who like the brand. And whether it is regulated or legislated or not, as a consumer we feel that is dishonest – and that could come back to backfire for the brand. Because of this, the US Federal Trade Committee implemented new guidelines regarding the relationships between advertisers and endorsements that encompass social media. As a result of this, businesses must disclose "material connections" between endorsed and endorsing parties. This means that businesses must ensure that if they provide free gifts or payment to, for example, a blogger who is writing about them, the blogger must disclose this fact. This requirement has been in place for traditional media since 1980. This disclosure obligation may impede customers from writing reviews for companies that pay them to do so.

Summarizing, we conclude that participating and contributing customers are not motivated by monetary rewards, but rather by non tangible, personal and social benefits, such as product related benefits, fun, pleasure, reputation, and the possibility to aid others, or altruism. These benefits differ for individuals. For firms that appeal on their contributions feedback is important, showing participants that their contributions matter. This feedback may mean nothing to them, if participants don't believe it is making a difference. The benefit has to be clear. If the personal or community related benefits are clearly presented, the monetary benefits seem not to matter. However, some participants may require monetary rewards, especially if they perceive to make relatively high costs (time, frequency, materials for modifications) in helping out the company. And if the monetary benefits are presented the community related benefits are less manifest. Monetary rewards may be important but often because it is used to signal how important a problem might be, or for compensating contributors for costs made to contribute.

**Design Proposition # 19** *To motivate customers (C19, O19), which are involved in the innovation co-creation process (C19) into participating, no monetary reward has to be made in foresight (I19.1), whether on participating or completing the task, because this may undermine the intrinsic motivation that people may have for participating (M19.1). When monetary payments are promised and given (I19.2), these should preferably be administered contingent on the task complexity and the performance shown, since participants feel compensated for valuable time, costs and effort spent in participation and possible exchange of the right to exploit the solution by the firm (IPR), because these will be perceived as a recognition of one's abilities and commitment (M19.2).*



**Figure 8-10: Design Proposition #19**

#### **8.4.5 Increasing creativity from participants**

How does this affect creativity, a characteristic needed from participants, especially in the front end of the innovation process, but also for making product or service suggestions and making modifications? Creativity involves thinking that is aimed at producing ideas or products that are relatively novel and that are, in some respect, compelling (Sternberg & Lubart, 1999). Some assert that the development of creative knowledge can not be enforced, but can be cultivated by rewarding creativity (den Hertog & Huizenga, 1998).

The number of ways in which creativity has been theorized and the variety of domains it has been applied to is impressive – for reviews, see Runco, 2004. What emerges are three paradigms (Glaveanu, 2010): (1) the *He-paradigm* where creativity is attributed to geniuses, unique and chosen individuals, whose creativity is based on exclusivity and disconnection; (2) the *I-paradigm*, suggesting that everyone is capable of being creative since it is no longer a capacity of the few chosen ones or unique psychological features, but coupled to personality traits, like intelligence; and (3) the *We-paradigm*, where social factors are included in the explanation of creative persons, showing renewed interest in phenomena as social creativity – creativity resulting of human interaction and collaboration (Brown & Duguid, 1991; Florida, 2002; Hargadon & Bechky, 2006; Purser & Montuori, 2000; Tuomi, 2002; Winsor, 2006) – and group creativity (Paulus & Nijstad, 2003).

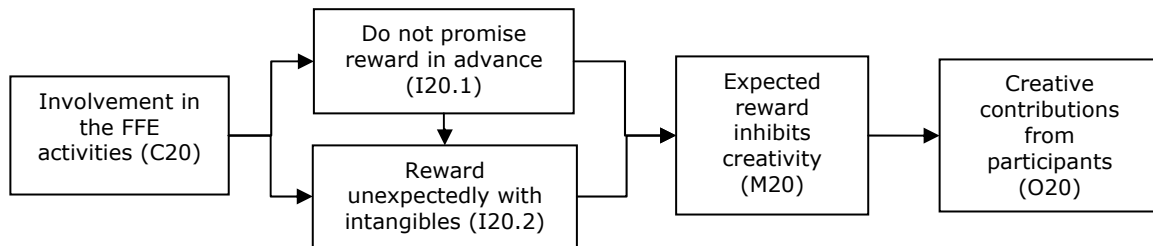
Amabile (1996) is one of the proponents of the last mentioned paradigm, and initiated the first research programs to investigate the role of social factors in the creative process. Her research proposed a causal relationship between intrinsic motivation and creativity (Amabile, 1983). Because cognitive flexibility and complexity are highest under strong intrinsic motivation (McGraw, 1978), creativity depends, in part, on an individual's level of intrinsic motivation for the work. By contrast, relatively straightforward (or algorithmic) aspects of performance, such as sheer technical quality, appear to be fostered by extrinsic motivation. As we have seen task difficulty or complexity has a positive influence on intrinsic motivation. More abstract problem formulations do seem to allow more originality; in a study project by Ward et al. (2004) three experiments were conducted to show that people can be induced to develop more novel products if they are given instructions that emphasize an abstract formulation of the task, and conversely, that they can be pushed in the direction of reduced novelty by instructions that emphasize specificity. Because stored properties at higher levels of abstraction would be less specific and constraining and allow a wider range of possible instantiation, more original products would be expected to result when people access knowledge in these more abstract ways.

Amabile's own experimental research has consistently demonstrated that the imposition of salient extrinsic motivators can lead to lower levels of creativity in actual performance – but not to lower levels of technical quality in the work. Interestingly, technical quality appears to remain strong under both intrinsic and extrinsic motivation in their research (Amabile, 1993). Creativity depends on two performance aspects: novelty and appropriateness. An idea or product can only be considered creative if it is both different from what has been done before (novel) and useful, valuable, or appropriate to a significant problem (appropriate). Moreover, the production of creative ideas appears to involve several different (though not linear) stages: problem presentation, preparation, idea generation, idea validation, and idea communication (Amabile, 1983). It is likely that the novelty of ideas is determined primarily at the problem presentation and idea generation stages of the process, and that the appropriateness (or value) is determined primarily at the other stages. It is also likely that intrinsic motivation is more important at some stages of the creative process than at others. To be specific, intrinsic motivation may be most important at the problem presentation and idea generation stages, the stages that are proposed to most strongly influence the novelty of the final idea. Thus, overall performance is likely to be optimized when motivation matches the stage of the work cycle-specifically, when intrinsic motivation is high during the problem presentation and idea generation stages of the creative process. Intrinsic motivation may be less important at the other stages. Indeed, it is possible that extrinsic motivation may play a facilitative role at those other stages. Some extrinsic motivators, such as clear deadlines or the promise of extrinsic rewards and recognition, may do no harm at these stages (since flexible, creative thinking is no longer the dominant mode); indeed, these motivators, as long as they leave the sense of self-determination intact, should serve to keep the individual engaged in the work. In other words, intrinsic motivation may be essential for novelty in the work, but some degree of some types of extrinsic motivation can help to ensure that the output will be timely, complete, and useful. Translating this to the mechanisms we will use to motivate customers in their involvement in the innovation process, we will need to intrinsically motivate participants in the front end activities, to be specific: the conception phase, i.e. by making the task interesting, challenging and relatively difficult as depicted in Design Proposition # 18, while motivation in the later stages (implementation and marketing) can be increased with the support of extrinsic incentives. Therefore, in addition to Design Proposition # 19:

***Design Proposition # 20***      *When co-creating with customers in innovations in the front end activities like needs assessment, idea generation, and idea screening, design and concept development (C20), it would be better for the creativity of the participants*



*(O13) not to promise any monetary rewards at all in advance (I20.1), and to reward participants unexpectedly with intangible rewards (I20.2), because the expectancy of a monetary reward may reduce intrinsic motivation and creativity (M20).*



**Figure 8-11: Design Proposition # 20**

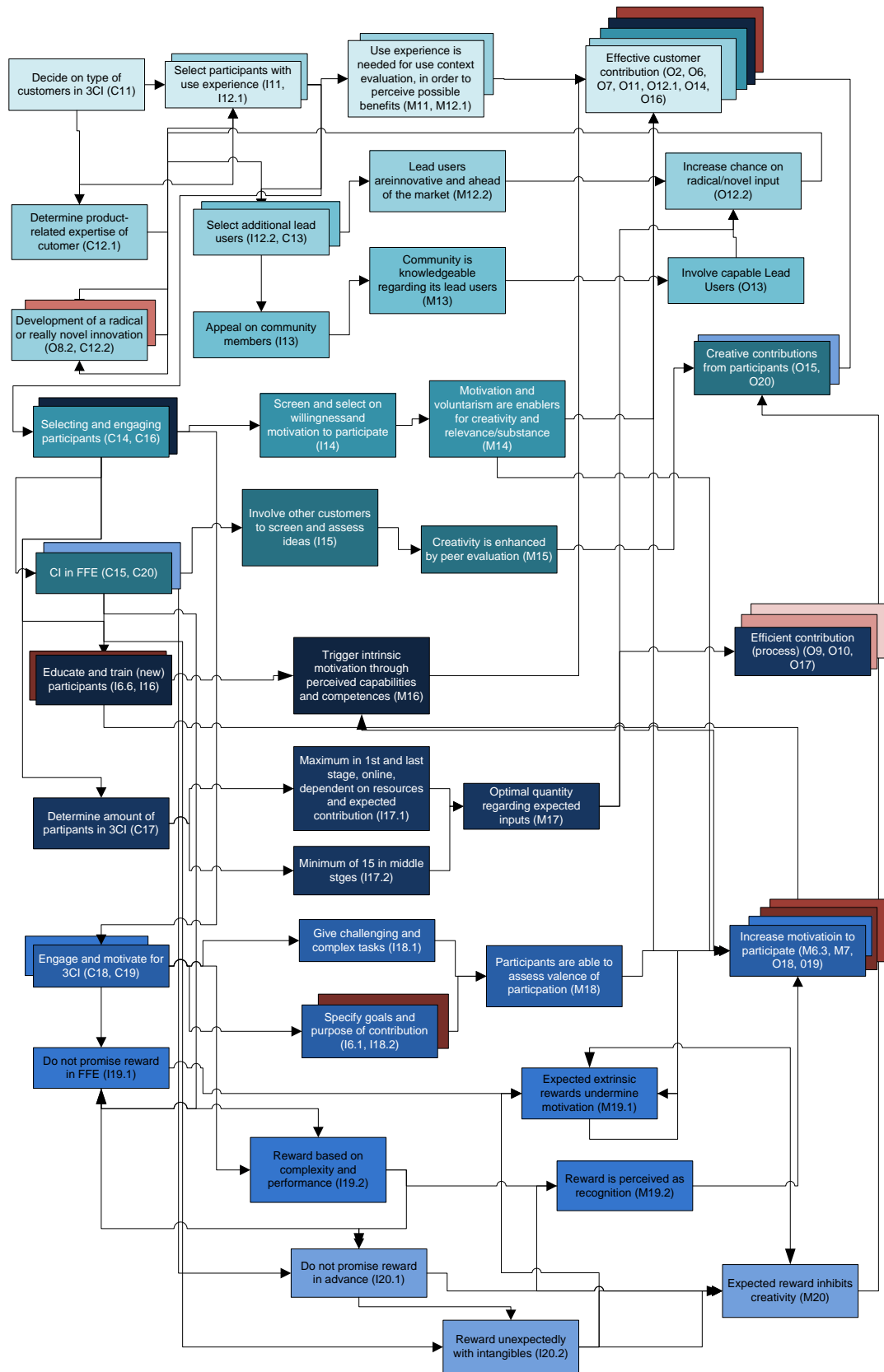
## 8.5 Conclusion to this chapter

In this chapter we have developed another 10 design propositions which deal with the type of customers to co-create with in innovations and the available interventions to engage with and maintain involvement from the selected participants. We have argued that all (potential) customers are eligible to participate, as long as they have a certain use experience with the product, service or category of innovation. Only in the case of a radical innovation, the company can choose to add some lead users or aim at diversity in order to increase the chance of generating really novel ideas or concepts. To find these lead users, the company can make an appeal on the customer community, since lead users are usually known in communities. To engage a diversity of customers we have recommended the use of crowdsourcing techniques and online tools in the earliest stage of the innovation process. In order to benefit in the best way from the participating ordinary and lead users, the company should select them on the basis of their will to participate. On top of that, participants should be trained or educated in the tools, techniques and methods that are applied during their involvement. To prevent a decrease of intrinsic motivation with participants, companies have to be very prudent with the promise and administering of financial rewards. Rewards can be given, but preferably unexpected and contingent on task complexity and performance demonstrated by the participant. Depending on the innovation stage and the channel of involvement, a minimum of 15 to an undetermined maximum of participants is possible, provided that the company reserves sufficient resources to handle the amount of participants.

In a similar manner as in the previous chapter we can combine all propositions in one diagram (Figure 8-12) in which we relate them to the 10 previously developed design propositions regarding the context for involvement (see Figure 7-12).

We now continue with the proposition reflecting the process of involvement, i.e. an answer on how to effectively and efficiently apply 3CI in innovations.

### Figure 8-12: Synthesis of Customer Design Propositions



# Chapter 9 Design Propositions regarding the process of customer co-creation

## 9.1 Introduction

With the 20 previously developed design proposition regarding the context of co-creation and the customer which is involved, we can now look into propositions that depict the process of co-creation. In this respect we have to look into the roles and contributions of participants, the innovation activities and stages suited for co-creation and the tools, techniques and methods that typically support and facilitate an effective and efficient co-creation with customers. In this chapter we will elaborate on the development of these process propositions.

## 9.2 Timing of co-creation: innovation process stages

### 9.2.1 Introduction to section: process stages

We have concluded earlier (section 2.7.4) that the contemporary innovation process consists of a certain number of phases, with in between stage gates where it is decided upon whether to continue or not. The number of phases differs between existing process models, but the process is in almost all cases a linkage between a new idea, the design and development of the innovation, including the concept testing and its subsequent commercial exploitation, that can be represented by a three-phased process. In addition, we have introduced a fourth stage, re-innovation or use, where customer input is also relevant, e.g. complaints and suggestions leading to the development of new products (see Table 9-1).

Phase	Product Innovation activity	Service Innovation activity
Conception	Requirement Analysis	Strategic Planning
	Idea Generation	Idea Generation
	Idea Evaluation	Idea Screening
	Project Planning	Business Analysis
Implementation	Development	Formation of cross-functional team
	Prototype development	Service /Process Design
	Pilot Application	Personnel Training
	Testing	Service Testing and Pilot Run
Marketing & Commercialization	Production	Test Marketing
	Market Launch	Commercialization
Use (Re-Innovation)	User Training	User Training
	Customer Service	Customer Service
	Warranty & Complaints Handling	Complaints Handling
	Maintenance/ Replenishment	Maintenance / Replenishment

**Table 9-1: Innovation process stages and activities**

At this stage it is also important to observe that even though consumers that act as user innovators will not apply a structured methodology there still will be an underlying sequence of their processes which is similar for all consumer-inventors. The typical process that user innovators seem to follow consists of two major phases – although we have to be aware that they do not represent formal phases, they are implicitly followed – of idea generation and idea development or realization (Tietz et al., 2005). Commercialization is something that only a few user-innovators conduct themselves (Hienerth, 2006; von Hippel, 2005).

We will be using this process phase framework to develop the design propositions regarding timing and contributions of 3CI.

### 9.2.2 Early involvement

Although, companies know that it is important to communicate with customers, the literature is not decisive in identifying precisely when customers should participate in the NPD or NSD process. Several research studies (Bacon et al., 1994; Khurana & Rosenthal, 1998) found that a significant factor in NPD success is performance in and execution of the opening stages. Many studies therefore emphasize the importance of customer co-creation for NPD's success in early phases of the development process (Gassmann & Wecht, 2005; Gruner & Homburg, 2000; Leonard, 1999; More, 1986; Neale & Corkindale, 1998; Pitta et al., 1996; Sioukas, 1995; Udwadia & Ravi Kumar, 1991; van Kleef et al., 2005; Winsor, 2006). These and some other studies also emphasize the importance of communication with customers in the early phases of the development process (Alam, 2006a; Calantone et al., 1995; Cooper & Kleinschmidt, 1986; Grden-Ellson et al., 1986; Moore, 1987; Reidenbach & Moak, 1986; Urban & von Hippel, 1988; von Hippel, 1978;1986; von Hippel, 1989; Yoon & Lilien, 1988). Developing an innovation in a closed approach is likely to fail, because it does not necessarily have to be something that customers want or need. For a similar reason, involving customers to test an already developed product, can lead to disappointment. Adoption of the innovation is more likely to happen when customers have been involved in the specification of requirements, or even better, in the strategic planning by expressing their needs and wants. Several studies emphasize the importance of customer co-creation in early phases of the development process. Similar findings come from the non-profit sectors (Brand, 2005) and informal innovation networks, which seem best suited for the fuzzy front end of innovations (van Aken & Weggeman, 2000). Von Hippel (2001b) recommends that "lead" customers be actively involved early in the NPD process. In contrast, customers with limited expertise should be involved less and later in the process (Athaide & Klink, 2009).

**Design Proposition # 21** *In deciding on the timing of Customer Co-Creation in Innovations (C21), the firm should aim at involving its customers in an early stage, preferably at the start of the innovation process (I21), to increase the effectiveness of customer input in order to achieve the greater chance for success (O21), as customers' wants and needs are more likely to be incorporated in the innovation (M21).*

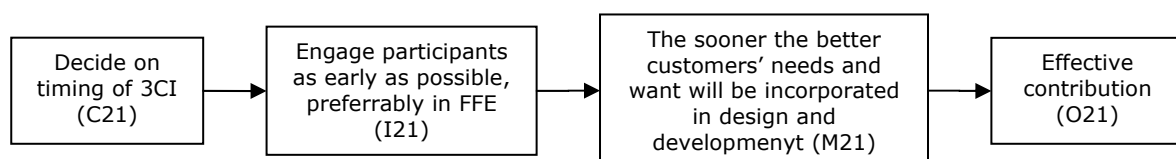


Figure 9-1: Design Proposition # 21

### 9.2.3 All stages and activities

Other studies highlight the importance of customer co-creation throughout the length of the development process (Cooper, 1994; Cooper & Edgett, 1996; Donath, 1992; Moore, 1987) on the assumption that customer needs for new products change throughout the design, development and purchase activities (Donath, 1992), or the fact that they can act as advisors to strengthen the concept all through to the end (Füller et al., 2006). Communicating with customers during the whole new product or service development process has been identified as a critical success factor in rapidly changing, and highly competitive environments such as financial services and particularly in business-to-business financial services where continuous innovation is the norm (Brown & Eisenhardt,

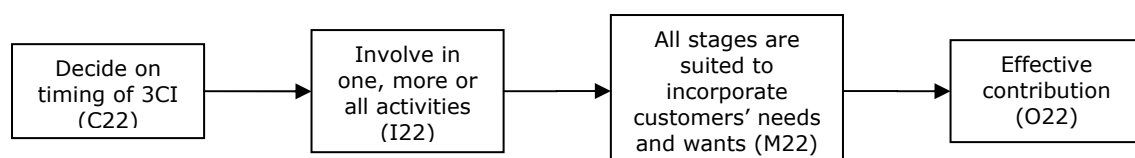
1997; Lievens et al., 1999). Alam (2002) found that users were involved in most of the ten stages in new service development. In particular the three stages of the development process, i.e. idea generation, service/process system design, and service testing/pilot run, were more important than the other stages. Thomke and von Hippel (2002) postulate that in the development of new products customers can be involved as innovators in many more phases than traditionally done. A study by Athaide and Stump (1999), for instance, showed that innovations developed by involving customers as partners in the whole NPD process were more successful than those using a traditional approach where the firm interacts with the customer predominantly during the launch or at the end of the NPD-process, implying that firms should involve their customers at a very early stage in the NPD or during the whole process. Projects that had a high user co-cocreation throughout the whole project resulted in a higher satisfaction than those that had not (Leonard-Barton & Sinha, 1993). An early and continuous involvement of customers in NPD can accelerate the product development process (Bailetti & Guild, 1991). Early co-creation also reduces the risk of having to redesign the product to meet users' needs after development (Dunn et al., 1991; Leonard-Barton, 1988).

Taking our initial model for phases in innovation processes (see 2.7.3 and Table 9-1) in consideration, we observe that customers' co-creation can take place for all process phases, and almost any project activities (Biemans, 1991). Co-creation seems likely throughout the complete process, or for just one or two steps. Gruner and Homburg (2000) found that a high intensity of firm-customer interaction during the stages of idea-generation, screening, prototype testing, and the launch significantly influenced the performance of new products. As for services, it was found that co-creation during most of the development stages, but particularly in the idea generation, service design, and testing, were important for the success of the new service (Alam, 2002). The phases that customers participate in product development include specifications establishment, concept development, detail design, prototyping, and final product. Kaulio (1998) found that the development phases that customers mainly participate in are specifications establishment, concept development, and the prototyping. Customers participate less in detail design and final product. Aside from only a focus on the customer to identify needs and wants, and to solicit new product ideas, the customer must also be an input into product design, and not just an after-the-fact check that the design is satisfactory. The customer must also be an integral facet of the project during the development phase by the use of multiple iterations of rapid prototyping and tests, so that by the end of the development, there are no surprises. Finally, as the project moves toward commercialization, the firm must ensure that rigorous customer tests (perhaps even test markets or trials sells) are built into the process, along with a properly resourced, well-planned launch phase (Cooper, 1996). In the context of the engineering industry, there exists evidence to suggest that the acquisition of a thorough understanding of customers' needs is best achieved through close and continuous interaction with potential customers. In other words, customers have an important role to play in establishing an optimal set of product design specifications (Rothwell & Gardiner, 1983). Alam and Perry (2002) found that, overall, customers contributed to all of the stages of the NSD program. In particular, the three stages of idea generation, service design and service testing/pilot run reported the highest frequency of customer input. Instead of protecting the design from interference in certain phases of the design process, prototypes should be transparent to all actors during the design process. Practitioners should make prototypes available to discussion and dialogue, both internally in relation to teamwork and externally in relation to clients (Saco & Goncalves, 2008). In uncertain and dynamic environments, an early feedback on a product's system level performance is needed in order to have a better performing NPD process. It means that development teams should focus on getting an early, and by definition, incomplete version of the product into customers' hands at the first opportunity (MacCormack et al., 2001). Teams must work with these customers to co-evolve the design, gathering feedback on the performance of

existing features, while being responsive to requests for additional functionality. On the other hand, involvement in participatory and co-design are typically phases in the design and development stage only – the idea or concept usually already exists. Empathic design seems to be a combination of market research (observations) and user experience design. User innovations can entail the involvement throughout the whole process up to the commercialization, which, however, is not typically excluded (Foxall & Tierney, 1984; Hienerth, 2006). Crowdsourcing can be applied in idea generation activities, but are also very well suited for commercialization, e.g. crowdfunding (Geerts, 2009) and re-innovation, e.g. RedesignMe ([www.redesignme.nl](http://www.redesignme.nl)). Research is however very scarce, if not, unavailable concerning the commercialization of innovations. There seems to exist ample experience on customer co-creation in this stage. This co-creation can take place either by involving customers in the marketing or advertisement development for the new product (Weber, 2008a), selecting them as launching customer or giving customers a sample, starting a word of mouth campaign (Eilander, 2008) or through user communities or social networks (Delre, 2007). These findings support our idea that all phases are suited for customer co-creation, but that the role of the customer and the intensity of the interaction with the firm differ along the stages.

Under the influence of the same mechanisms – success is enhanced when customers' needs are embedded in the innovation, one could argue that the more stages customers are involved in, the greater the guarantee for this embeddedness. Pitta et al. (1996) suggest that, to increase product success consumers and other external information sources should be part of idea generation and should provide input throughout the rest of the product development process. Salomo et al. (2003) propose that NPD projects that integrate more customers during a longer period of time are more customer oriented, and therefore more successful, than projects with only short and limited customer input.

**Design Proposition # 22** *In deciding on the timing of Customer Co-Creation in Innovations (C22), all innovation stages, phases and activities are suited to co-create with customers (M22) so firms can decide on co-creating with customers in only one, more, but preferably all stages and activities (I22) to achieve an innovation that is needed by the customers (O22).*



**Figure 9-2: Design Proposition # 22**

#### 9.2.4 Alternating participants

Research from Alam (2002) and Gruner and Homburg (2000) confirm that customers may contribute to nearly all the stages of new service or product development, although the extent of their contributions varies across various stages of the process. The role of the customer throughout the innovation process does not remain the same. Rothwell and Gardiner (1983) are one of the first to depict this changing role of the user in this process. In the early 'inventive' phase, when the basic idea or concept is being developed, some user input is clearly required to determine that a market need exists, to elicit the nature of the need and to establish that the concept has the potential to fulfill that need. As the concept is developed towards a marketable product, often passing through a series of prototype models, it increasingly can be refined better to match the precise performance specifications of a representative sample of its intended market. This will often involve prototype testing on users' premises or in an environment similar to that of its actual deployment. Following commercial launch, users, as a result of

accumulated experience, will be the source of many improvement or incremental innovations over the lifetime of the product, and it is during this period that, cumulatively, they will generally make their major innovatory contribution (Rothwell & Gardiner, 1985). When the customers are well involved from the start they feel ownership of the project. This may result in customers engaging themselves in a continuous development process.

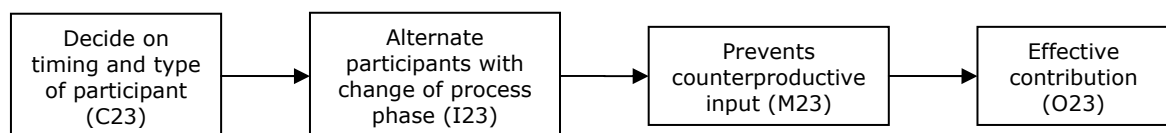
Where manufacturers typically interact with only one supplier, one university, or other 3<sup>rd</sup> parties during the whole process, the identity and amount of users involved vary with the stage of process, e.g. a large number of interviews, but only one user for development, and a few for testing (Biemans, 1991), see also Design Proposition # 17. Involving the same customers throughout the complete project incurs some limitations to the success of this involvement. Participating customers can show opportunistic behavior or increase the extent of information asymmetry between the company and the customer (Stump et al., 2002). In our practice we have experienced that engaging with the same customers throughout all stages poses some objections, like a decreasing motivation as time goes on and the effect that people get carried away with their own ideas, thereby blocking new ideas. Innovation projects can easily take a long time, from a few months to a few years. Being involved throughout this whole project, even though he is not involved in every step or decision, is a long time for a customer to maintain motivation (Kanter, 2001; Martin et al., 1999), or for not to get carried away by product features than by his own needs (Rackham, 1998). If the customer has also been involved in the idea generation activities, his participation in later stages, like product testing or product launch could be impeded when they do not recognize the implementation or adoption of their own ideas, or leading to over-customization (Alam, 2006a). Greta et al. (2008), finally, come to the conclusion that people that have participated in the process of idea generation are unlikely to be able to select or screen the best ideas after that, because of an unconscious attachment to their own ideas.

Füller et al. (2006) propose to integrate selected members of a community more than once or iteratively in different stages, so these users may get the status of development advisors which strengthens the idea of collective invention and trust building (Prahalad & Ramaswamy, 2000). However, it is unlikely that the same individual will repeatedly provide the most effective solution or idea when participating in more than one similar projects (Surowiecki, 2004). Engaging with the same customers throughout the complete innovation project, therefore creates close relationships with these particular customers. Danneels (2003) explains the process of engaging with customers by firms through the enactment theory of Weick (1979;1993). Firms build knowledge of their customers through generating responses, like marketing actions and involvement in product development, from their customers, which they then interpret. The interpretations give rise to a mental model of the customers, which is then acted upon in further marketing and product development activities. If successful, this process tends to produce tight coupling with customers. Tight coupling with customers leads to a better understanding of customers' needs, closer tailoring of products and services, higher customer satisfaction, easier forecasting of demand, and closer relationships. Loose coupling with customers, on the other hand, is necessary to remain flexible in a dynamic environment, and keep an open eye to opportunities and threats. Developing close links with customers is both beneficial and detrimental, the last one for radical innovations which can be coped with by co-creating with a heterogeneous set of potential customers (Bonner and Walker, 2004). Lettl et al. (2006a) discovered through their study that users that have been suitable testers of a radical innovation are not necessary in a position to play the role of inventors and/or developers in subsequent projects. And in addition, someone who has been creative once in a specific situation is not necessary capable of repeating this behavior in subsequent or new situations (Powell, 2009). Another risk regarding the involvement of the same customers in all stages and projects, which

applies mainly to the B2B sector, is that firms risk being locked in their customers' habitats, resulting in possible governmental interventions, a decrease of innovation projects or a loss of interest in the needs and wants of non-involved customers (Macdonald, 1995). In a similar way, creating an enduring alliance with one or more customers could lead to such commitments and dependence between alliance partners that this could lead to innovations that are very well accepted by the alliance partners, but neglected by other buyers (Lewis, 1995).

Summarizing, we can conclude that: (1) all stages and activities of the innovation process can benefit from customer co-creation; (2) the sooner the customer is involved in the innovation process, the greater the success will be; and (3) involving the same customers in all innovation activities can lead to some counterproductive results. We therefore propose to try changing participants in each stage. Shifts in participation must be made to avoid the possible danger of premature fixation on individual problem-solving ideas championed by individual users. Changing the participants will also prevent participants to select or screen their own input as the best. In addition, this change of participants will prevent the customer feeling the owner of the idea and therefore claiming its intellectual property rights. This will imply extra effort to accustom and eventually train these new participants each time, but on the other hand it ensures new and different ideas and insights throughout the whole process, prevents the creation of too close links with these participants, and also creates diversity in participants, increasing the chance for success:

**Design Proposition # 23** *In deciding on the participants in the different phases of Customer Co-Creation in Innovations (C23), firms that intend to involve the customer in more than one stages should avoid involving the same customer(s) in all these stages and should try to alternate customers per phase (I23), since involvement of the same customer(s) can lead to several counterproductive actions from these customers (M23) that may prove to be detrimental to an effective contribution (O23).*



**Figure 9-3: Design Proposition # 23**

## 9.3 The role and contribution of the participating customer

### 9.3.1 General views on roles and contributions

In documents regarding strategic management and quality management, researchers classify customers, in the process of creating values, into two large categories and five different roles. According to Finch (1999), Gersuny & Rosengren (1973), Kaulio (1998), Lengnick-Hall (1996), the first category is: Customers assume the role of the upper stream as an input party. They become part of the organization's activities including customer as resource, i.e. contributing information input, clarifying the problem (Mills & Morris, 1986), and customer as co-creator/co-producer, giving time and effort without which the service could not be produced (Gersuny & Rosengren, 1973). The second category is: Customers assume the role of the lower stream as an output party including customer as buyer, customer as user, and customer as product. Nambisan (2002) felt that the above classification structure might be used to examine customers' participation role in new product development, especially in the three customers' roles of resource, co-



producer, and user. Nambisan and Nambisan (2008) distinguish five roles for customers in a virtual or online community that go parallel to the innovation stages: (1) product conceptualizer, by generating improvement and new ideas; (2) product designer: customers design their own product using virtual tools; (3) product tester; (4) product support specialist, by supporting other customers; and (5) product marketer, by passing along product information and shape perceptions. Most companies pursue community initiatives that are focused on a single role, but authors propose to look for multiple roles. If a company regards customers solely as users, it will not be able to compete against firms that have more robust views of customer roles (Schneider & Bowen, 1995). Lettl and Gemünden (2005) reach a similar classification, based on literature survey: (1) customers as inventors (Foxall, 1989; Thomke & von Hippel, 2002; von Hippel, 1989); (2) customers as co-developers (Herstatt & von Hippel, 1992; Kaulio, 1998; Mantel & Meredith, 1986; Normann, 1996); (3) customers as evaluators (Bailetti & Litva, 1995; Ciccantelli & Magidson, 1993; Schoormans et al., 1995; Zeithaml et al., 1990); and (4) customers as testers (Bailetti & Litva, 1995; Biemans, 1991; Dolan & Matthews, 1993; Schoormans et al., 1995). Other studies (Chervonnaya, 2003; Enkel et al., 2005; Füller et al., 2004) come to similar taxonomies, where another role is distinguished, the customer as a marketer, recommending a service to others (Nambisan & Nambisan, 2008; Normann, 1996). Customers can therefore be regarded as service users in innovations, where their role is that of a "partial employee" or co-producer, conducting any task a normal employee might execute (Bitner et al., 1997; Kelley et al., 1990; Mills et al., 1983). In co-production value creation, customer effectiveness becomes as much of a firm's worry as own employee effectiveness. 'Customer productivity' becomes as important a criterion as internal and supplier productivity. Customers should be managed as assets (Ramírez, 1999).

Prahalad and Ramaswamy (2000) state that the role of the customer in service innovation should be:

"contributing knowledge skills and experiences, his or her willingness to share frustrations, requirements, problems and expectations, and his or her readiness to experiment and learn" (2000:80).

Depending on individual customers' willingness to engage as well as their skill levels, they can thus participate at various levels of co-creation (Prahalad & Krishnan, 2008). Participation then consists of three different components: (1) user-company relationship, referring to the relationship between NPD-staff and user, e.g. being informed, approving work, etc.; (2) responsibility refers to managerial assignments or activities that are typically performed by a project leader; and (3) hands-on activities which reflect the hands-on development activities that users personally perform (Barki & Hartwick, 1994).

Biemans' study (1991) indicates that potential users were found to contribute to all but one stage, i.e. the trial stage, which consists of finalization of the design, trial production and finalization of the marketing plan. Their contribution consisted of suggesting a new product idea, either directly or indirectly through criticizing existing products, providing general information about user requirements, commenting on formulated new product concepts, assisting in the development of prototypes, testing developed prototypes, and assisting in the marketing of innovations. The most frequently used mechanisms to involve users in marketing the innovation were having them demonstrate new equipment to other potential users, function as references, present scientific papers at conferences, and promote the product with colleagues. The involvement of users in the actual development process typically consisted of assisting in the actual development activities or in providing feedback to developers and answering specific questions.

From the perspective of product R&D, Kaulio (1998) performed a complete review on the methods of customers' participation in new product innovation. He proposed that the

types of activities that customers participate in product development include design for customers, design with customers, and design by customers which he derived from Eason (1993). QFD is an example of design *for* customers, because it needs only input for product requirements. User-oriented product development, concept testing and beta testing are examples of design *with* customers, because users are presented with solutions which they can accept or reject. The lead user approach, consumer idealized design and participatory ergonomics are typical examples of design *by* customers, since users participate in the activities. Leonard-Barton (Leonard, 1999) proposed the “modes of User Involvement” in which users participate in companies’ new product development, and summarized users’ participation into four modes. This concept is similar to the concept proposed by Kaulio (1998). She found that when users aggressively participate in the complete process of product development, the average time spent is shorter.

Hartwick and Barki (2001) observed four basic dimensions of participation in Information Systems Development in organizations: responsibility, user-IS relationship, hands-on, and communication activities. All four dimensions were found to significantly relate to influence, indicating that the more users participate on each dimension, the higher their level of influence on the management of the project and system developed. These results indicate that users can influence how a project is managed and the eventual system that is developed by engaging in participatory activities.

From this review it may be obvious that participating customers can assume a variety of roles that vary from passive to active ones in all stages and activities of the innovation process. Since we are interested in an active participation of the customer, i.e. aware, voluntary, engaged, and goal-directed, we will focus on these contributions. We can observe that customers then take roles in the NPD or NSD process that are very typical for NPD-team members. In other words, customers are not only seen as potential users of the innovation that is ideated and developed by the firm, or as a source for market and needs information, but as ‘team members’ that generate ideas, screen ideas, co-design, co-develop, test, co-market and, finally, evaluate the innovation by using it. But, as has been observed, customers might even participate in the management of the innovation process.

We will now look into the specific contributions we can expect from customers in the subsequent innovation stages and activities.

### ***9.3.2 Contributions in the conception phase***

In this sub-section we will discuss the first stage: innovation conception.

#### **Strategic Planning and Requirements Analysis**

The principal goal behind early customer co-creation (and customer co-creation in general) remains to improve a company’s innovation success rate amongst increasing R&D-expenditures and high new product failure rates. The manufacturer expects advantages outweighing the disadvantages coming out of early customer co-creation (Gassmann & Wecht, 2005). One of the key fuzzy-front-end activities is the up-front evaluation of the market potentials of a new product. An accurate assessment of the market potentials of new products can help firms estimate the eventual success of their new products, the time needed to develop them, the development and production costs associated with them and the types and amounts of resources needed throughout their development (Pollack-Johnson, 1995). A popular method to do this the expert opinion, e.g. the Delphi panel, in which industry experts, academicians or company executives act as the expert. In a longitudinal empirical study, Ozer (2009) demonstrates that both experts and lead users can generate accurate product evaluations, but also, that the impact of lead users on the accuracy is larger than that of product experts. The

underlying mechanism for this better performance by lead users is that, by definition, lead users are familiar not only with current needs, but also with future needs and solutions. In addition, lead users possess information about both the user needs (i.e. demand side knowledge) and product trends (i.e. supply side knowledge), while product experts cover only product-related information (i.e. supply side knowledge). In a similar fashion we can reason that ordinary users also know considerable aspects about use, and therefore about the demand side, that their opinion about market potential might matter. Using group consensus or group converging techniques, e.g. Delphi (Dalkey, 1969), is a possibility to make accurate predictions about market potentials. This has not been researched, but we use this as a design proposition.

Gassmann and Wecht (2005) define, based on four in-depth case studies, four new customer roles, enhancing the well-known lead user approach (showing that besides the Lead-User approach there are other relevant means of customer integration into the FFE): opportunity sensor, complementary specialist, specifier, and selector. We will review them briefly:

1. *Opportunity Sensor*: This role focuses mainly on the problem identification or idea generation part of the innovation process. Focussing on trends and scenarios possibly leading to new opportunities and chances. The type of knowledge involved is market-related and tacit. In this role the specific contributions the customer delivers - in addition to his needs which are defining his basic role as customer - are information about latest trends, new technologies, or new market developments.
2. *Complementary Specialist*: Explicit knowledge in a field complementing the core competence of the manufacturer is the main asset of these complementary specialists. They can be found both for specific market knowledge and product related expertise in fields such as styling or production. The focus lies mostly on the combination and thereby conversion of existing tacit knowledge to create innovative solutions pushing the envelope of the manufacturers own innovation capabilities.
3. *Specifier*: Besides the complementary knowledge roles described above there is one more specific role grounded on the integration of customers with deep expert knowledge right in the manufacturer's competence field. This enables the customer not only to push and steer innovation via the product specification but also to take the leading role in the integration process (from the customer's perspective the same process can be seen as supplier integration). The required level of knowledge exceeds the one typical for the Lead-User approach and limits the number of cases where this approach may be chosen.
4. *Selector*: Ending the front-end of the innovation process are procedures necessary to feed new concepts into the new product development process. At this stage an integrated customer can build on his user experience with existing products and help in selecting and refining promising product concepts. Tacit customer knowledge is converted into feedback and increases the manufacturer's chance to develop a successful new product. See Table 9-2.

As for services, Alam and Perry (2002) come to a similar viewpoint and suggest the following, though limited, activities by customers:

- Strategic Planning: customers can give feedback on financial data;
- Idea generation: customers state needs, problems and their solutions; criticize existing service; identify gaps in the market; provide a wish list (service requirements); state new service adoption criteria.

- Idea screening: customers can suggest rough sales guide and market size, benefits and attributes; show reactions to the concepts; liking, preference and purchase intent of all the concepts, help producers in go/no-go decisions. The objective of screening is not an in-depth analysis of each idea, but to select from a large list of ideas the few that warrant extensive and expensive analysis (Rochford, 1991).
- Business Analysis: customers can only give limited feedback on financial data, including profitability of the concepts, and competitors' data.

	Opportunity Sensor	Selector	Complimentary Specialist	Specifier	Lead User
Customer Contribution	Future Market Knowledge	Application Knowledge	Complimentary Competence and Leveraging Capability	Deep R&D Knowledge	Coming Need and Concept Ideas
Rationale	Integrate customer to identify market and technology opportunities	Integrate customer to select and improve concepts	Integrate customer to conduct leading innovation project	Integrate customer to jointly develop specifications	Integrate customer to jointly develop specifications
Key Issues/ Managerial Challenges	Early in the FFE  Select customer based on his ability to predict future market requirements  Consider also customers' customers	At the end of the FFE  Select Customers based on their experience level and usage intensity  Focused on specific application knowledge	Covering most of the FFE  Select customers or intermediaries based on their specific knowledge necessary to leverage the suppliers core competence  Focused on complementary knowledge	Focus on the later parts of the FFE  Select customers that are technology experts and co-create with them  Focused on core competences	In the middle of the FFE  Select customers based on their leading edge needs and high motivation  Focused on customer needs

**Table 9-2: Customer roles in the conception phase (Gassmann & Wecht, 2005)**

## Ideation

A specific activity in the conception phase is the idea generation or ideation. Ideation is the process of forming and relating ideas. It is a concept utilized in the study of New Product Development, creativity, innovation, design thinking and concept development (PDMA). Businesses can acquire insights and ideas gleaned from any customers' source, like call centers, retail data, and focus groups. Collaboration extends in many directions: when companies pursue a new product, many of them consult with contract specialists and suppliers and test prototypes with their customers (Bughin et al., 2008; Mullins & Sutherland, 1998). As part of the move into the Internet, usage of ideation in the product innovation process has become an integral element. On-line focus groups are conducted entirely on-line—everything from recruitment and screening (which the recruiter does via e-mail) to moderation of the discussion itself (Aaker et al., 2000). In this context, employees or customers are invited to participate in the ideation process, via a web portal (open on the internet or intranet), where they can suggest new ideas, rate other ideas, and collaborate with the entire community in the process of ideation. As for user communities, in this early stage of the innovation process the participating community

members take the role of sources of ideas and evaluators of those ideas, by commenting on each other's ideas (Füller et al., 2006).

In the idea generation phase users are usually the inventors of the radical innovation. By looking at other technological domains (openness for new technologies) and using analogical reasoning – which is considered a key source for radically new ideas (Dahl & Moreau, 2002; Holyoak & Thagard, 1995). However, asking customers for ideas may impede contribution. In their study Alam and Perry (2002) found that most service firms had to be pro-active in customer co-creation in the start of the program; customers hardly came with ideas themselves. And off course, not every customer-originated idea will be an instant hit (Donath, 1992). Le Masson and Magnusson (2003) also investigated a new way of utilizing user involvement. Previous research into user involvement in service innovation has found that the effective contribution of users might be minor, since their innovative users' ideas generally are non-feasible (Kanter, 2007; Magnusson, 2003). Recall the case of IBM Innovation Jam where many ideas, of which the majority small or allegedly unimportant. The paper assumes that this might be due to the way ideas are processed by companies, i.e. the idea selection process. A new way of utilizing the users' ideas, called *generative model revision*, is proposed and tested. Far from being the result of "innovation wizards", i.e. extraordinary genius people, this appeared as a technique well grounded in the most recent design theories. The technique uses users' ideas as leverages for revising the generative models. It has been first developed and tested for mobile telecommunication services with their users. The theory helped to extract the main features and principles of this new technique so as to make it useable and useful in other industries. It is well adapted to situations where there are no established dominant designs and where product-services functionalities and customer segmentations are not yet stabilized. It can be compared to other techniques aiming at investigating emerging customer usages and needs but it differs from them by directly involving the users in the innovative idea creation and by deeply involving the designers. The technique is mainly based on orienting the user to be a "hacker" of expert knowledge; it can support this process by providing the users with demonstrators that can be used either to create conformant services, or services that differentiate. The technique appears as an efficient tool for an "innovation function", it supports an engineering of emerging usages. The implication of this is that firms can make use of presumably unusable ideas from, usually, ordinary users instead of dismissing or discarding them, which is one of the emerging traps in innovation.

### ***9.3.3 Contributions in the implementation stage***

#### **Design, Concept development, Prototype development**

Involving the end user in design activities has become an essential part in design research (Sanders, 2006). Within the design and engineering stage the term co-creator (Lengnick-Hall, 1996; Nambisan, 2002), co-designer (Piller et al., 2005) or co-developer (Neale & Corkindale, 1998) describes the role of the participating community members more accurately (Füller et al., 2006). Customer co-creation may take the form of periodic review of designs in process (e.g., mockups, prototypes, partial products), periodic attendance at design meetings to discuss tradeoffs, and providing application technology expertise to the core technology expertise provided by the technology originator (Neale & Corkindale, 1998), since they might interpret the technology differently from the technology originator. Prototyping refers to the mutual learning process that takes place in a cooperative design setting in constructing prototypes. Customer co-prototyping is then an option to develop prototypes with users' participation (Brodersen et al., 2008). Prototype testing can result in a flow of user-initiated improvements to the product design or service (Patterson, 2002).

Walsh et al. (1992) describe three ways in which the direct involvement of the user can enhance iterative product design and development process: (1) Provide invaluable market know-how to convert an idea into a commercially viable product and give guidance on the best performance/price blend; (2) Provide an 'opinion leader' to endorse the design in the market place, so enhancing the success of the product; (3) Result in a flow of user-initiated improvements to the original design. Patterson (2002) examined how the design and development process are influenced by feedback loops when users are involved in the configuration of the product. Individual and organizational creative capacity will increase as a robustness and scope for redesign increases. She shows that the formation of close feedback loops between designers, developers and users can contribute significantly to the identification of new ideas and the discovery of new concerns from experimentation. As well as designers and developers, non-specialist actors such as users and intermediaries play an active role in providing knowledge to increase creativity by fitting products to their purposes and imparting significance (Sawhney et al., 2003; Verona et al., 2006). The product is considered 'unfinished', evolving and acquiring its meanings in its implementation and use. Effective communication must occur within the organization throughout the innovation process including the findings of product and service testing through to post-deployment. The success of a design process is dependent upon creativity, collaboration and decision routines between the designers, developers and individual users of the product. The user is stimuli to escape from accustomed conceptualizations of the products and the more unrelated the feedback from the user is to the product at hand, the more likely it will provide original solutions. Patterson proposes to conduct this interaction between designer and user by an intermediary, since the different worlds of these participants has to be bridged. One could think of a market researcher. It is recognized that the translation of their feedback by the intermediary has an impact on the product throughout the design and development process.

Lettl et al. (2006a) found that in the development phase of the radical innovation, inventive users took over the networking function in the development process, a role that is classically associated with manufacturers'. Users do not have all the resources to develop themselves.

For services customers can make the following contributions in the implementation stage (Alam & Perry, 2002):

- Formation of cross-functional team: customers can join top management in selecting team members.
- Service design and process system design: customers contribute by reviewing and jointly developing the blue prints, suggesting improvements by identifying fail points; they can also observe service delivery trials.
- Personnel training: customers can observe and participate in mock service delivery process, suggesting improvements.
- Service testing and pilot run: they can participate in a simulated service delivery process; suggest final improvements and design changes.

### **Product, concept and prototype testing,**

New product evaluation is a dynamic process and generally can be conducted at five major stages including concept testing, prototype testing, pretest market, test market, and launch (Ozer, 1999). It is not new that customers assume the role of testing new products. Early research also proved that customers assume the roles that have an extremely high level of productivity in the product and original module testing (Dolan &

Matthews, 1993; Nielsen, 1993). In both industrial and consumer goods, we can see customers' participation in product testing. It is even more obvious in the software industry (Cusumano & Yoffie, 1998; Leonard, 1999; MacCormack et al., 2001). However, it is less applied in NSD (Johne & Storey, 1998). The reasons for a high involvement in prototype testing, are the possibility to still adapt the design to customer's requirements, and the detailed and precise information regarding an existing and working prototype, which customers can provide (Gruner & Homburg, 2000; Mullins & Sutherland, 1998).

Concept testing refers to a variety of approaches employed in assessing the marketability of a product or service idea prior to its development (Acito & Hustad, 1981; Moore, 1982). Previous research has concluded that predevelopment activities, including concept testing, are particularly effective in separating successful and unsuccessful new products (Cooper, 1996). As a result, concept testing can be considered as one of the most critical steps in the new product development process. Consistent with this importance, there are quite a few concept testing methods. Among the most widely used methods are analogies, expert opinions, intentions, multi-attribute models, focus groups, and scenario analysis/information acceleration (Ozer, 1999). Concept tests typically rely on a written description of the product or service but are sometimes augmented with sketches, nonworking models, and/or mockups or promotional advertisements. Ideally the information transmitted during the test should offer a realistic description of the potential product and be able to communicate the desired "image" to the participant (Acito & Hustad, 1981; Page & Rosenbaum, 1992). Concept testing is often carried out imperfectly in NSD because it is difficult to develop accurate concept descriptions or to demonstrate new service benefits to customers (Johne & Storey, 1998).

In a typical concept test research, customers are also asked to indicate their likelihood of purchase using a summary measure of acceptance, the so-called *willingness to pay (WTP)*. Because this process tends to be reasonably complex, these data are usually collected through personal interviews using central locations or in-home sampling. Sample sizes for this stage can vary from 40-50, when few concepts are involved and the analysis is uni-variate, to 300-500 (Moore, 1982). Estimating user WTP is known to be a difficult task (Franke & von Hippel, 2003). Popular methods to do this are conjoint analysis (Davenport & Harris, 2009b; Moore et al., 1999), where respondents value objects that consist of several attributes containing price. There is also the *Contingent Valuation Method (CVM)* in which respondents are directly asked how much they are willing to pay for a product or service (Mitchell & Carson, 1989). But CVM-results are found to often significantly overestimate WTP (Lindsey & Knaap, 1999). Instead of using an open-ended approach the CVM can make use of payment scales (Donaldson et al., 1997). This will still render the results unreliable and too general, so involving customers by having them predict a price is not a good option. However, to our own experience, customers can also be given the role of criticaster, i.e. by commenting and giving feed back on the concepts presented to them, suggesting changes, improvements or even alternative uses (Weber, 2009a).

There are three types of prototype testing. The first is alpha testing, in which the prototype is tested under laboratory conditions within a firm to see whether it delivers the intended performance. The second is beta testing, where people use it for a specified time period within their own usage environment and report their experiences. Finally, in gamma testing, people use it indefinitely and report any problem they might have with the product (Ozer, 1999), i.e. similar to what we describe as the re-innovation stage. Both novices and experts can evaluate a prototype (Urban & Hauser, 1993). Beta testing is one of a variety of procedures by which a firm has potential users "try out" a product and report on their experience. Originating in the computer industry, the term refers to testing with a small number of potential adopters, usually not randomly chosen (Dolan & Matthews, 1993). Wind and Mahajan (1988) mention beta site test design as one method

for achieving integration of design and commercialization, viz. "plans for commercialization should be integrated as part of development efforts. Integration can be accomplished, for example, by selecting key prospects as candidates for 'beta sites' (Wind & Mahajan, 1988:307). Dolan and Matthews's (1993) examination of twenty-one beta test programs reveals a much richer set of possible benefits than just a 'test of the system'. They distinguish three major classes of purposes:

1. Product function: For this purpose, the idea is simply "to see if the product does what it is designed to do." While most firms do extensive alpha testing prior to the beta phase, they recognize that the demands put on the system by external users cannot be always anticipated and, even if anticipated, realistically simulated in-house. In addition to the basic function check, data can be obtained pertaining to desired refinements of the product and/or added features. Yet, this aspect of testing is considered as a passive involvement of the customer.
2. Product support/marketing mix: A commonly useful practice is to extend the test beyond the product itself to support elements (such as training and documentation) and the marketing policies for the introduction. Data from a beta test can also help a firm determine the optimal positioning, target market selection, and pricing for the introductory phase.
3. Sales promotion: A general market impact stems from the fact that a successful beta test reduces other potential adopters' uncertainty about the product. This uncertainty reduction occurs as publicity about the successful test spreads. A second way a specific beta test site success has general market impact is as a reference account or demo site.

It is recommended to grow the number of beta sites over time; begin with sophisticated customers with good relations with the firm. Beta testing involves risk. There is a risk in too few sites. A large number of early sites increases the burden of intense information flow and risks account relationships if the product turns out not to be as "bug-free" as thought. The "ideal" early testers are those who place a high value on receiving the new product early and who have good relationships with the firm, a non-mission critical application, and technical sophistication. Over time, as risk is mitigated, the set of testers should be expanded to obtain better representation of the market as a whole (Dolan & Matthews, 1993). Finally, companies should monitor beta product performance on a regular basis. Their relationship with testers should be such that the sites will take the initiative in immediately reporting bugs. This regular contact helps account relationships and can indicate quickly whether the test should be terminated or expanded. Final summaries are useful for testimonials, and passing enhancement requests on to the next-generation development team (Dolan & Matthews, 1993).

The most often connoted, and still very widely used method to involve users in engineering and design, is the usability test. This means that potential users are simply invited to laboratories or other test dedicated premises to try out the product or service in question. Usability testing differs from market research, since it does not only gather information, but involves systematic observation under controlled conditions to determine how well people can use the product or service. It's objectives are to find out several aspects from the user's response when using the product, e.g. (1) performance: how much time, and how many steps, are required for the user to complete basic tasks; (2) accuracy: how many mistakes did the user make; (3) recall: how much does the user remember afterwards or after periods of non-use; (4) emotional response: how does the person feel about the tasks completed, is the person confident, stressed, would the user recommend this system to a friend, etc.



### ***9.3.4 Contributions in the marketing and commercialization stage***

#### **Diffusion**

The diffusion of innovations is defined for Rogers (1995) "as the process by which an innovation is communicated through certain channels over time among members of a social system". Based on the development of modern technology and marketing practices, Peres et al. (2010) redefine diffusion as:

Innovation diffusion is the process of the market penetration of new products and services, which is driven by social influences. Such influences include all of the interdependencies among consumers that affect various market players with or without their explicit knowledge (Peres et al, 2010: 92).

Most discussions about innovation in the past stressed a strong focus on the diffusion processes, considering users as relatively passive actors in relation to the adoption of technologies (Fontana & Sørensen, 2005). Customer co-creation in the commercialization stage – the diffusion of the innovation – has therefore not yet been subjected to much research. Partly, this can be explained by the approach of diffusion at the aggregate level, which basically means that the sales of a new product are described, explained and forecasted according to macro variables (such as advertising, word of mouth, price, competition) that describe the market as a single entity. However, they exclude the micro level variables that affect the individual adoption of the consumers (Delre, 2007). In business context, close collaboration with customers in the innovation process creates customer commitment which results in direct sales and increase the customer's motivation to recommend the product to third parties (Gemünden et al., 1996). Frambach et al. (1998) find in their study that adoption of an innovation by business customers is not only determined by the product's or service's perceived advantages and the size of the adopting firm, but also by marketing efforts of the supplying firm to position the innovation in the marketplace and to reduce the risk of adoption. But in addition we observe that the commercialization stage typically is about an activity with customers, making the involvement an implicit component of this innovation stage, probably rendering specific research as obsolete. So, Füller et al. (2006) do not come further than proposing a role as end users of launched innovations by community members. According to Peres et al. (2010) diffusion consists of three types of social influences that have garnered recent interest: word-of-mouth (discussed later in this section), network externalities and social signals. Network externalities exist when the utility of a product to a consumer increases as more consumers adopt the new product. Network externalities are considered to be direct if utility is directly affected by the number of other users of the same product, and indirect if the utility increases with the number of users of another, complementary product. Interpersonal communication is not necessarily needed for network externalities to work. Social signals relate to the social information that individuals infer from adoption of an innovation by others. Through their purchases, individuals may signal either social differences or group identity. These signals are transmitted to other individuals, who follow the consumption behavior of people in their aspiration groups. While social signals can be transmitted via word of mouth and/or advertising, neither is a necessity. These signals are observed by potential adopters who infer from them the social consequences of adoption (Peres et al., 2010). Because of the independence of network externalities and social signals from personal communication – which is regarded as the role and contribution of the participating customer – we will focus our design on word-of-mouth and marketing/advertising by the customer.

Every commercial success starts with an idea for a new product or service. Innovations have been said to be generated by companies that want to satisfy customer needs, but also by user innovators who generate new products or solutions for their very own needs

(MarketingMax, 2008; von Hippel, 1988). The integration of users as external sources for the innovation process has been considered an important factor in the development of innovation generations (Rothwell, 1994; Rothwell & Gardiner, 1985). Thus, user innovators are part of a larger innovation system (Lundvall, 1998; Lundvall et al., 2002). While user innovations might not be relevant in all industries (Pavitt, 1984), and companies can also be misled by listening too closely to general users and customers (Christensen, 1997; Christensen & Bower, 1996), other authors (Lilien et al., 2002; Morrison et al., 2004; von Hippel et al., 1999) have shown the importance of leading-edge users for new product development (NPD). Still, the literature has not focused on the commercialization of user innovations due to the fact that the motives of user innovators to start innovating are not (primarily) economic. One exception is the study by Shah (2000), who identified the existence of lifestyle firms in the windsurfing industry. Instead, user innovators have been assumed to act differently from the traditional market system (Raymond, 1999) and to neglect the typical product diffusion and selling process a manufacturer would aim for. Thus, the phenomenon itself has been analyzed (von Hippel, 1976; von Hippel, 1977), thus revealing the general conditions for user innovations and community interaction to occur without focusing on the process and outcomes of commercializing user innovations. User-innovators usually diffuse their own innovations or play an important part in the diffusion, although they do not automatically engage in its commercialization by founding their own firms (Hienerth, 2006; Lettl & Gemünden, 2005; Shah, 2000; Shah & Tripsas, 2004; von Hippel, 1988). Some of them have become user manufacturers; others have simply sold their innovations to traditional companies or worked as lead users in innovation projects for a certain consideration (von Hippel, 2001a). The diffusion benefits by freely revealing designs in a community of like-minded innovators, increasing search efficiency for all users in the community (Baldwin et al., 2006). Our conclusion and recommendation for the protocol would be for manufacturers not to rely too much on the contribution of user-innovators to jointly commercialize their user-innovations, but to either postpone their entry into the market until model-specific market volumes have reached levels that justify their investments, or to purchase the innovation rights from the user-innovator.

As for the tendency to adopt new products faster and more heavily Schreier and Prügl (2008) suggest to invite such lead users beyond the fuzzy front end of generating radically new product concepts, for instance for new product concept testing methods. Furthermore they can serve as opinion leaders who fuel and accelerate the process of diffusing newly launched products (Morrison et al., 2004; Schreier & Prügl, 2008; Urban & von Hippel, 1988).

A survey of nearly 4,000 consumers in 10 key markets undertaken by Gartner in the fourth quarter of 2009 showed that there are three roles that are key influencers in the purchasing activity of the rest of the population. A mere 20% of all social media consumers, who can be categorised as 'connectors', 'salesmen' and 'mavens'<sup>25</sup>, act as key influencers on the purchasing activity of the vast majority of the rest, according to Gartner. Connectors act as a bridge between different social groups of people and enjoy introducing them to each other. There are two key types – heavy connectors, who have varied but tight-knit circles of friends, and family with whom they maintain very regular contact, and light connectors, who interact across a much wider range of groups in a less frequent fashion. Salesmen have extensive numbers of social contacts and personalities that impel people to act on information in much directed ways, which includes buying products. Mavens, meanwhile, are experts in particular areas to whom others go for

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<sup>25</sup> Market mavens have been defined as "individuals who have information about many kinds of products, places to shop, and other facets of markets, and who initiate discussions with consumers and respond to requests from consumers for market information," (Feick & Price 1987: 85).

advice. Unlike salesmen, they are not out to persuade people but to acquire and use information related to their own interests. But marketers should be warned that mavens are just as happy to post negative comments about a product or company as positive ones. According to Gartner these three groups are most receptive to marketing messages and most likely to act on them, which means that marketers would obtain best results from targeting them. Companies attempting to use social networks should develop relationships with key customers over a period of time and progressively refine the social network profiles of those individuals. In this way, the most suitable individuals can be targeted with the right information, products and promotions in the most cost-effective way.

### **Word of mouth**

Word-of-mouth (WOM) is an important manner to diffuse product and service experience (Delre, 2008). Customers may spread word of mouth in order to help the company (Brown et al., 2005), to help other customers to make good choices (Price et al., 1995) or to appear knowledgeable about the product or industry (Feick & Price, 1987). Buzz, or word of mouth, affects the sales of all kinds of products, but it seems especially important for what economists call "experience goods." These are products that consumers cannot evaluate just by looking at specifications, so they rely on their social environment whether or not to choose for a specific product or brand (Arnould et al., 2006). For experience goods, the nuances make all the difference (Postrel, 2003). Different markets imply different network structures of consumers (Delre, 2008) and these structures may affect the final success of a new product that enters the market. With respect to the market characteristics, we first find that markets with high social influence are more uncertain concerning the final success of the innovation and that, on average, the new product has fewer chances to spread. Here, as consumers affect each other to adopt or not at the beginning of the diffusion, the new product has more difficulties to reach the critical mass that is necessary for the product to take off. Word of mouth, including reviews, allows potential buyers to learn from other people's experiences. It isn't perfect, since different people react differently to the same product. But word of mouth allows buyers to get some information about the underlying value without actually buying or even using the product or service. The idea that the global and local structures of the consumers' relations affect the way consumers behave and consequently the aggregate dynamics of the market is based on the fact that the human decision making highly depends on what other people do (Cialdini, 2001). It seems as if customers don't trust marketing, they trust each other (Kanter, 2001; Tapscott & Williams, 2007). Customers trust the opinions of friends and family members about products and services far more than they trust marketing communications from a company (Jurvetson, 2008). As they perceive, a company wants them to buy its product so that it can make money, but fellow customers or friends recommend a product because they believe in it. The product works for them, and they believe it can work for others. Those others, therefore, have more trust in the recommendation. When people are exposed to new ideas and given the chance to own them and share them, there's a ripple effect that happens because they are finding real value. Individuals who feel a sense of ownership are incredibly willing to get out there and promote it, even if the original idea wasn't theirs (Powell, 2009). Due to the growth of social media people nowadays increase their personal social networks, increasing the power of WOM (Hunt, 2009; Kozinets, 1999; Powell, 2009).

A way of exercising WOM by users is through online discussions in forums and communities (Godes & Mayzlin, 2004; MarketingMax, 2008) and social media. Users evaluate quality together, thereby influencing their fellow community members (Arnould et al., 2006; Kozinets, 1999). Cell phones, laptops, PCs, blogs, and social networking sites are all tools that consumers use to constantly communicate with each other. Consumers also rely a lot on UGC, like reviews, reports, testimonials, and such. Although

there is only a small percentage of active contributors in UGC, like blogging, a much larger part of the consumers read it and are influenced by these (Rainie, 2005; van Renssen, 2007). Ideas circulate as fast as scandals and blog posts linger on the Web forever (Baker & Green, 2005). This suggests that marketers can tap Internet forums and social media to see how their products might fare. Allowing consumers to actively promote or rate your products will increase its diffusion. So, leveraging WOM, by e.g. providing customers with business cards, references, samples and promotional items to spread the word, is an intervention that companies can apply to speed up diffusion (Hunt, 2009; Winsor, 2006). Gifts seem to create reciprocity with the receivers, resulting in the return of a favor (Cialdini, 2001), in this case exerting WOM and increasing loyalty (Hunt, 2009). With limits, and within reason, giving things away that can be easily copied is perhaps the wisest marketing alternative instead of copyrighting and IPR-measures (Kozinets, 1999). Giving things away allows marketers to build loyalty and trust and allows the company to make their margins on what is difficult to copy for others.

By now we know that the Internet may play as an important platform for starting innovations. However, the Internet may also play an important role in the diffusion of innovations. By increasing customers' access to various online information sources, and by opening up new online markets, the Internet may improve information flows and increase the net benefit of adoption, ultimately leading to faster rates of technological diffusion. Prince and Simon (2009) recently investigated this assumption, and found that the Internet adoption of household products has a positive effect on adoption of these products. The underlying mechanisms for this phenomenon is that Internet increases adoption rates both through access to increased information about new products (via online research) and through online shopping. However, there is significant variation in the effect across products. The acceleration in the diffusion process due to Internet access is greater for better known products, like DVD players, because there is more information available online and a better developed online market for these products. The implications of these findings for firms are that firms can influence the adoption by (1) reducing online information and transmission costs for customers; (2) reducing transaction costs and/or prices through online shopping, thus increasing the net valuation of new products (ease of buying online and lower online prices). Customers' role in this stage is therefore shaped through search and buying behavior on the internet.

Markets are dominated by social influences e.g., individual decisions depend on what others consumers do. In this respect, a few strategic details can determine whether or not a new product becomes the object of a wave of adoptions driven by a positive WOM (Delre, 2008). An innovation can succeed in spreading out in a given population, if there is a combination of a small number of favorable events that convince a critical mass of consumers to adopt the new product (McAlexander et al., 2002). However, the same innovation can become a flop in the same population of consumers, if promoters miss these events or do not coordinate them properly. Because of these market characteristics, promotional strategies represent crucial factors that can determine a break-through of a new product (Delre, 2008). Nowadays marketing campaigns highly make use of VIPs. However, surprisingly enough, these campaigns do not immediately guarantee the success of the diffusion. Sometimes they work perfectly (e.g., almost all people that follow tennis remember that Rafael Nadal, the second player of the rankings, wears Nike clothes) and some other times they can remain quite unnoticed (not everybody remembers which brand of clothes Roger Federer, the first player of the ranking, wears). Delre conducted an analysis on the roles that VIPs play in the networks of consumers. His results show that, *ceteris paribus*, VIPs do have a strong positive effect on the final penetration of new products and that their real power consists of the informing role they have in the network. These results suggest that they do not have more convincing power than other normal consumers but their positive effect on the diffusion relies on their high visibility.

Delre (2008) compares two typical promotional seeding strategies for the entry of a new product: the *throwing rocks* strategy and the *throwing gravel* strategy. While the throwing rocks strategy consists of targeting a single group or a few big groups of highly connected consumers as seeds for the innovation, with the aim of igniting the diffusion in a precise area of the network, e.g. through member-gets-member actions (Verbeke et al., 1995), the throwing gravel strategy consists of targeting little groups randomly as the initial seeds of the innovation and aiming, in this way, at igniting the diffusion in many different areas of the potential market. He finds that, especially for markets characterized by high social influence, the optimal strategy in terms of market penetration consists of a balance between the two extreme strategies. The results of his agent based model suggest to ignite the diffusion with groups of cohesive consumers that are large enough to exert strong social influence to others and to place these groups in distant areas of the potential market. This is confirmed by Godes and Mayzlin (2004): Word of mouth spreads more quickly when it begins in different places or among people with different interests. (...) However, the simulations generate this result for markets with strong social influence (e.g. brown good durables like DVD players but also clothes, etc.) but it tends to disappear in simulated markets characterized by low social influence (e.g. white good durables like refrigerators but also grocery, etc.). In particular, the lower the social influence consumers experience within a market, the more the optimal strategy moves towards the throwing gravel strategy. Underlying mechanisms: usually the WOM, consisting of the advice of a friend, is much more valuable than the mass media message that advertises the new product (Mahajan et al., 1995).

Identifying the potential influencers could help firms improve effectiveness of their online marketing strategies through word-of-mouth information propagation. A common approach for identifying influential online reviewers is to compare the accumulated ratings of the reviews or the authors (Turney, 2002). Review mining is another method to discover the influential reviewers; without the public rating information, the influential strength of an article or an author on others' purchasing decisions could be evaluated based on the content of reviews (Yu et al., 2008). Li et al. (2010) develop and test a framework to evaluate the influential capability of online reviewers and recommend appropriate ones to support word-of-mouth marketing. The proposed model analyzes the content of after-use reviews provided by online users and the reviewing activities of these authors to identify the potentially influential reviewers. As the relationships between trust and influence are very tight, they use a trust network mechanism to evaluate the effectiveness of their framework in discovering influential reviewers. A reviewer with a higher trust value not only reveals that there are more users trusting him but also indicate that he could influence more users. Compared with the results developed by popular author and review rating approaches, their proposed model has a higher accuracy rate in predicting the influential strength of the reviewers. Their method assists in carrying out online word-of-mouth marketing, which can save a lot of resources in finding customers. For firms, the influential power of each reviewer can be measured clearly and the reviewer most worthy of being marketed can be easily identified by the proposed model. After the influential nodes have been appropriately identified, firms are able to develop some special marketing strategies to take advantages of these potential reviewers. For instance, enterprises can provide free trial versions of the new products or special discounts to these targeted customers/reviewers. This proposed method provides a helpful and effective name list of reviewers to improve marketing behaviors.

The study by Godes and Mayzlin (2004) found that how much buzz a show gets does not predict much about how it will do. Who's talking matters more than how much they talk. One remarkable benefit for companies is that customers who participate into companies' processes are more likely become committed and spread positive word of mouth about the company (Antikainen et al., 2006). Self-designed products via mass customization toolkits deliver a substantial value increment to customers, not only during the design

process, but afterwards as well (Franke & Piller, 2004; Franke & Schreier, 2006). Studies have shown that the added value exceeds 100% in terms of users' willingness to pay for self-designed versus standard products in cases where users perform design tasks themselves aided by online toolkit (Franke & Piller, 2004). Other research shows that certain ideas and products created by certain types of users can be highly attractive to others, despite the fact that the user-created product is only a solution to one's individual problem (von Hippel, 2002), confirming our notion that the mere idea that another user might have developed the idea or product makes it more attractive than products developed by professionals. Firms should make public that the new product has been developed by and with customers to increase its adoption chances. A deduction we can make from this is that people that have participated in an innovation would value the innovation more than in the case that they haven't been involved. We have to observe, however, that negative WOM will have a greater impact on potential customers' purchase decisions than will extremely positive WOM (Yao et al., 2009). A well-known example is the website Dell that got more hits than the original Dell site in a short time.

"In the old days, someone may have a bad consumer experience and tell ten people. But now with the rise of blogs, Myspace and Facebook, that person might be able to tell 10.000 people. That totally changes the dynamic and importance of consumer experience." (Bruce Temkin, Forrester Research).

Communities, online or offline, are also very suited for the diffusion of innovations (Jeppesen & Laursen, 2009). They stimulate word of mouth (WOM) for advertising, and are more powerful than ordinary advertising (Hagel & Armstrong, 1997). A 2008 study (Beeline Labs et al., 2009) among more than 140 companies that have built an OLC (both B2B and B2C) revealed that communities can increase the revenue per customer, but, more important for our study, increase the product introduction success ratios. Franke and Shah (2003) investigated some sports related online communities and discovered that the assistance that members gave each other positively affected innovation diffusion both inside and outside the community; this result is confirmed by Jeppesen and Laursen (2009). However, the results also show that assistance does not guarantee diffusion. Diffusion is dependent of (1) more assistance from the inside than from the outside; (2) the use of the community as a network; (3) the number of assistants; and (4) the frequency of all assistance activities. The authors suggest that the underlying reasons for this dependence are that assistance improves the quality of an innovation and will therefore initiate diffusion, and the more assistants, the more people there are that can tell others about the innovation, i.e. the epidemic analogy. The assistance and feedback that members give on each others ideas and developments can serve as a good predictor for innovation success (Braun & Türtscher, 2009). Similarly, the free sharing of ideas can serve the diffusion process in a positive way. In addition, in the context of a user innovation community, end users act as change agents pursuing the adoption of an innovation by convincing the hosting firm of the user innovation community, to adopt the innovation (Di Gangi & Wasko, 2009). Adopting the ideas that are the most popular or supported in the community provides firms with the opportunity to signal to end users that they are responsive to customer needs and helps build strong relational bonds and goodwill between the firm and its end users. Additionally, adopting the most popular ideas from the community ensures that there will be demand in the marketplace for the innovation. Firms can thus learn from this that involvement of communities in an early stage can be beneficial to the diffusion of the innovation, as long as information is open, feedback is given in an open manner, and member to member communication is supported and facilitated.

Consumer groups can be found in (online) communities, while their influence on other consumers while being placed in the so called distant areas of the potential market can be enhanced through their participation in social media networks, e.g. MySpace, Facebook, etc. In fact, through social media participation, the WOM-effect becomes

multiple, implying that instead of reaching an average of only 5 to 10 other persons by one person, the reach and influence is increased with a factor of 10 to 100 (Hunt, 2009).

Research (Price et al., 1995) implies that marketers and public policymakers could encourage market helping behaviors by appeals to altruistic motives, thereby stimulating faster information and product diffusion. For example, in the same way that some companies attempt to stimulate the web of word-of-mouth communications with advertising, such as, "If you enjoyed your stay with us, tell a friend," public policymakers could stimulate diffusion of product safety information and other information programs by promoting others' welfare.

## **Marketing and advertising**

Customers can also contribute in advertising. As marketing problems are fuzzy, ill-structured, messy, with open mismatches between what is and what might be (Jurg et al., 2008), they might be regarded as challenging by customers in order to motivate them (Design Proposition # 18). Customers can also be invited to make their own commercials (Tomesen, 2007a;2007b). Research by Muñiz and Jensen Schau (2007) show that consumers, acting independently from marketers and advertisers, as an expression mode of UGC, have started creating and disseminating documents that strongly resemble in form and intent ads for the brands they love. They call this phenomenon *vigilante marketing*, which they define as:

"unpaid advertising and marketing efforts, including 1-to-1, 1-to-many, and many-to-many commercially oriented communications, undertaken by brand loyalists on behalf of the brand" (Muñiz Jr. & Schau, 2007:35).

These vigilante marketers can be found in *brand communities*, where members discuss advertising, negotiate about their meanings, contribute to the corporate's brand lexicon, and even design their own advertisements (Arnould et al., 2006). It is found that this WOM by users attracts more new users than official advertising by the company (Muñiz Jr. & Schau, 2007). The authors suggest that advertisers should give consumers the tools and encourage them to create advertising content for the firm's brand. Consumers are quite savvy in their understanding of advertising. This creative expertise should be leveraged.

In a similar way, an empirical study of German and English-speaking outdoor communities found that most communities have created their own community "brands," sometimes involving logos that are applied to products commonly used by community members, etc. In a detailed study of one community, we find community brands can gain very powerful positive associations within community memberships, and that many members are willing to pay considerable premiums for products bearing the community brand (Füller & von Hippel, 2008). These findings suggest that producers face a previously-unexamined source of both competition and collaboration with respect to profiting from brands, see also Arnould et al. (2006). One interesting possibility is that producer brands may sometimes find it profitable to co-brand with user communities: this form of co-branding created the highest brand premiums we observed in our study.

Wind (2008) proposes 7 strategies that can increase both the rigor and relevance of marketing research and practice. These strategies will raise marketing's usefulness and impact on the organization while sustaining its rigor and achieving the desired outcome for all its stakeholders. One is to change their view of the consumer as a passive recipient of marketing messages. In a YouTube world where people are customizing computers, jeans and their own communications, consumers can actively develop and disseminate marketing messages. Another advice is to shift from company-branded products to customer-branded solutions. If customers need more than one product for a problem, they have to do their own integration of brands – often with the same company. In

addition to branding, companies need to engage customers in co-developing, co-producing, and co-marketing these solutions. This way customers can create their own branded solutions that are unique to them, in a way that they assemble playlists on iTunes or draw together widgets on a computer desktop (Wind, 2008).

Alam and Perry (2002) found in the commercialization stage customers' contributions in new service development can consist of:

- Test marketing: commenting on the marketing plan, giving detailed comments about their satisfaction of marketing mixes; suggesting desired improvements. Test marketing is considered to be more important than market research, as market research is not a reliable means of assessing consumer acceptance of new services (Johne & Storey, 1998).
- Commercialization: adopt the service as a trial; give feedback about overall performance of the service along with desired improvements, if any; word of mouth communication to other potential customers.

## **Sampling**

Product sampling is one of the most effective ways to introduce a new product (Marks & Kamins, 1988). Samples are offers of a free amount or a trial of a product for consumers. A sample might be delivered door-to-door, sent in the mail, picked up in a store, found attached to another product, or featured in an advertising offer (Kotler, 1984). The best way to demonstrate a product's superiority is to get the target customer to try it. Sampling enables a firm to achieve this. Sampling, in fact, offers a firm an effective vehicle to create brand awareness, promote brand identity, improve brand loyalty, and expand product category. By distributing samples to a competitor's customers, sampling also offers a firm an effective offensive mechanism to negate the competitor's promotional programs and to encourage brand switching (Jain et al., 1995). Sampling is more effective than other consumer promotional tools when consumers without direct experience find that verifying the claims of the product is either difficult or risky. Some situations commonly encountered include: (1) a product's features or benefits can not be fully conveyed in advertising (e.g., a unique flavour or aroma in food products and cosmetics) or there are restrictions on how and where a product can be advertised (e.g., ban on broadcast advertising for cigarettes); (2) the product has some new or improved features that can be appreciated to overcome adoption risk only when the product is tested and used by the target customers (e.g., computers, computer software, ethical drugs, text books, and cosmetics); and (3) word-of-mouth plays a major role in influencing the product adoption, and hence trial among innovators, early adopters, and other key influencing agents is critical to the success of the product (Perkins, 1994). Jain et al. (Jain et al., 1995) provide an analytical framework that enables one to assess the impact of product sampling on the diffusion of new products, both durables and nondurables where word-of-mouth plays a major role in influencing the product adoption and hence trial among innovators, early adopters, and other key influencing agents is critical to the success of the product. They (Jain et al.) have concluded that target sampling to opinion leaders and innovators is more effective than neutral sampling, and they further suggest that sampling for durables should be no more than nine percent of the total number of potential adoptions. Therefore, sampling also forms a way to involve customers in the diffusion of the innovation. Firms can provide opinion leaders in user communities with product samples, requesting them to give feedback about them to other users.



### ***9.3.5 Contributions in the re-innovation stage***

#### **Refining and improving product requirements through feedback**

Habermeier (1990) and Maidique and Zirger (1984) argue that user requirements and product characteristics can often only be discovered if the innovative product or process is actually used, sometimes for a long period of time. Habermeier contends that the more novel and/or complex a new product or process, the stronger the argument. Thus, usage allows for the refinement and crystallization of actual rather than perceived user needs and product requirements. In addition, Habermeier (1990:275) also argues that since the user organization

"constitutes a complex system, embedded in an often equally complex environment...it is not at all surprising that the user will learn about his requirements only as quickly as he learns about the peculiarities of his environment".

Intensive communication between manufacturer and user then is vital to the process of improvement and re-innovation (Shaw, 1985).

Even given that the manufacturer has a clear understanding of user needs and requirements, product usage still has an important role to play, due to the

"definite and almost insurmountable limits on what can be learned about technology through theoretical studies and laboratory experimentation" (Habermeier, 1990:276)

It is essential also to consider the essential role played by users and customers in the innovation processes. This happens since they have a strong influence in the social side of innovations, modifying and improving the products helping to shape technology in all its phases (Fontana & Sørensen, 2005). This can happen actively and in a dominant mode through many different means, including in most of them positive or negative feedback (Conway, 1993). Feedback from users through usage may range from the identification of faults, limitations and alternative uses for the innovation, to the design and development of technical solutions to overcome such faults and limitations, improve performance, accommodate for alternative uses and provide additional functionality. Where implementation has followed such modification to the original product or process, the user is potentially able to provide information to the manufacturer on the next iteration of the innovation. In the Cathedral and the Bazaar (Raymond, 1999), the role of feedback is tested and explained exposing this as a critical mechanism that allows open source software development process to function and in many cases outperform other development processes. Feedback can encompass not only bugs or incremental changes but larger ideas or use stories.

The work of both von Hippel (1988, 2005), Shaw (1983), and Gardiner and Rothwell (1985) shows that customers can continue to play an important role after the commercial launch of the new product. The role of the user in re-innovation can take a variety of forms: user suggestions schemes, frequent visits to users, feedback via agents, and planned meetings with particularly critical users to elicit detailed feedback concerning suggestions for improvement (Gardiner & Rothwell, 1985; Shaw, 1985), stories of how they use or would use a product or service, or what type of experience they want (von Hippel, 2005), or even suggest new uses for the product. Moreover, it is in the post launch re-innovation phase, during which the product undergoes considerable redesign, that customers will generally make their major contribution as a result of accumulated expertise regarding the product, its performance and usage (Rothwell & Gardiner, 1984).

Stump et al. (2002) suggest that customer involvement includes obtaining reactions to the product design and securing

"... feedback on desirable product modifications and alternative applications ..." (p. 443).

Customers can evaluate the product's interface with existing operation and feedback can benefit supplying firms because such feedback

"... alerts sellers to buyers' perceptions of salient product attributes and reduces market uncertainty ..." (Stump et al., 2002:444).

Another dominant view of the user-manufacturer interaction is that it is iterative. Von Hippel (von Hippel, 1994) argued that user need and solution information should be placed together at the same location in order to solve design problems. But this type of information is often so "sticky" - costly to transfer from one location to another - those problem-solving activities must iterate between users and a manufacturer. From this view, users first draw on local need information to specify the desired product or service. Then the manufacturer uses local solution (capability) information to develop a prototype to meet user specifications. The prototype then is returned to users so that they can evaluate the product using the local need information. The iteration continues until the users are satisfied. But the iterative view also opens up the possibility of learning-by-interacting with users in that users and a manufacturer engage in much design iteration. Manufacturers learn about the specific user's specific needs and the specifications of products and services over time, and users learn about the manufacturer's capabilities; in this way learning-by-interaction is feasible (Bae, 2008).

What users learn by using the product constantly feeds back to the firm via various channels blogs, user communities, online forums, etc. with relatively low cost and effort. These feedback mechanisms are much more detailed and sometimes filtered by the communities, creating important information that traditional marketing research can not provide. Manufacturers and service providers learn what problems and issues occur during actual usage and use this information to update or improve the current product. Users nowadays have a much better idea of the inner workings of products and how manufacturers produce them due to the frequent reverse engineering (often by hackers) and information sharing among the users in various communities (Bae, 2008).

Another way we can involve customers in the use stage of the innovation, is through complaints and suggestions. Aside from effects like regaining customer's trust, loyalty and satisfaction by properly dealing with complaints (Blodgett et al., 1997; Maxham & Netemeyer, 2003; Smith et al., 1999; Tax et al., 1998), knowledge about complaints also give the manufacturer or service provider valuable insight in many areas, of which the improvement of product and service design and delivery is one (Marquis & Filiatrault, 2002; Tax & Brown, 1998). But customers can also develop innovations themselves that can later be commercialized by companies, the user innovations (von Hippel, 1988). Shaw (1983) found a similar pattern for user innovations in the UK medical instruments industry, where in a sample of 33 innovations, 25 were transferred from the user to the manufacturer via a process of continuous and multiple interaction. Significantly, 22 of these innovations were commercially successful. So, successful firms should encourage customers to complain or modify products through corporate policies and the actions of employees. However, research findings are that the average firm takes a passive approach to complaint management (Firnsthahl, 1989). As a result, up to 95% of customers do not complain following a service failure (Smith et al., 1999; Tax & Brown, 1998).

### **Support of other users**

As users, customers may provide product support to other users. Customers often obtain professional knowledge related to products from continuous accumulation of usage experience and then further provide assistance to other users. Also, these professional users often are more capable of resolving product problems than manufacturers' internal

product assistance professionals (Kay, 1999). With the aid of the Internet in recent years, manufacturers are able to support customers' interaction with tools that are low cost effective and develop multiple interaction relationships among customers, relationships beyond the double directional interactive relationship between manufacturers and customers. Nambisan (2002) mentioned that in order to encourage mutual assistance between customers, manufacturers might authorize a certain customer a special position in the community, which will make him more willing to contribute to product support (Chan & Lee, 2004). Such user-to-user support can ultimately lead to new ideas and innovations (Jeppesen, 2000).

Co-design activities are the necessary prerequisite of mass customization in order to fulfil the needs of individual customers. However, these activities are also a major driver for complexity, effort, and perceived risk from the customers' perspective, limiting the success of mass customization strategies. Pine coined the term "mass confusion" (Teresko, 1994) as a metaphor to describe the burdens and drawbacks for the consumer as a result of mass customization interaction processes. We see mass confusion as one major explanatory factor for the delay in adoption of mass customization technologies in business practice. (p.2). Discussions with managers from different companies about mass confusion gave us a first indication that interactions among customers could become a means to reduce mass confusion. Case study research then provided additional evidence that customers are able to support each other in the co-design process by jointly performing the design process or giving each other feedback and inspiration during this process. This notion of collaboration in customer groups, however, challenges an implicit assumption in most of the literature on personalization and customization: (Mass) customization and personalization is about offering individual customers a customized product or service according to their personal needs (Piller et al., 2005).

## **Modding**

Some firms are now realizing that modding is an opportunity that can be exploited by (selectively) shifting some innovation-related tasks to product users in the final market. A paper by Jeppesen examines how it is possible and attractive for manufacturers to "out-source" product development tasks to innovative user communities by focusing on the phenomenon currently known as "modding". The term originates from "modification" which is the art of applying change to an original. Modding is the act by which users modify an existing hardware or software consumer good to perform a function that is not necessarily authorized (or imagined) by the original manufacturer. Mods - the outcome of modding - range from minor alterations to very extensive variations of the original product. Modding is a variety of user innovation. In this emergent business model, a product platform models is coupled with an Intellectual Property Rights arrangement that blocks the user innovator from commercializing his complements. This arrangement makes it impossible for the user innovators to appropriate monetary values and benefits manufacturers because it ensures that the mods built for a given product platform remain free to all users and, because it allows manufacturers to pick up the best complements, package them, and commercialize them (or parts of them) as their own proprietary products (Jeppesen, 2004).

## **Experimenting with platform models**

The intention with platform models (Gawer & Cusumano, 2008; Koufteros et al., 2005) is to leverage ongoing innovation efforts in the external environment at the application level for product development (Cusumano & Selby, 1995). The platform models also describe a situation of business-to-business innovation: platform manufacturers design the platform architectures while external specialist suppliers (referred to in the literature as "complementors") develop complements compatible with the platform. In the platform model many different complements can be added to the same basic platform architecture. The idea is that complements are produced in a decentralized manner by

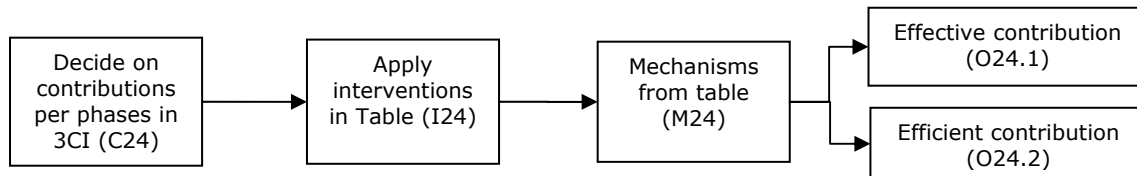
external developers and that the platform manufacturer can increase platform sales when numerous popular complements are available because this enhances the value that users can derive from owning the platform. A platform manufacturer needing complements tries to encourage complementors to develop for his product platform by supplying compatibility-enhancing interfaces and development toolkits to potential complementors. If a complementor is to be motivated to build new complements, it is essential that he (not the platform manufacturer) retains the intellectual property rights to them and is thus able to sell them to consumers. Platform business models in, for example, Intel, Microsoft, Cisco and Palm exploit this model. The advantage of this model to the manufacturer is that when external developers make the complements, it frees the platform manufacturer from the costs of developing the complements. The advantage to the consumer of owning a platform with many complements is the flexibility of being able to choose from a pool of different complements offered for sale by complementors and to swap one complement of the system for a better one. When many quality complements are available an advantageous situation can arise: with platforms, consumers are able to “mix and match” (Garud & Kumaraswamy, 1995; Matutes & Regibeau, 1988) complements in order to get a product that is more likely to serve their needs. The downside of the model is that the platform manufacturer relinquishes potential business areas (those of complement production) to external suppliers who will also charge consumers for the complements. The tradeoff for the manufacturer is thus one of selling more platforms versus the loss of the complement business areas as well as the lack of control over complement pricing. Some firms (e.g. computer games producers), however, are now using an alternative platform methodology for the production of complements. Instead of drawing on professional developers in the business-to-business context for their complements, manufacturers draw on user communities of consumers of the original product for their complement production. Whereas in the “conventional platform model” the final user is limited to purchasing and mixing and matching ready-made manufacturer complements to manufacturer-made platforms, users here create the complements they need themselves. They also share these complements among users/consumers of the platform for which the complements have been made (Jeppesen, 2004).

With this set-up in place, manufacturers have two options to exploit the innovations. They can employ a “hands-off strategy”, letting the complements drift freely in the community and benefiting from the effect of the availability of free complements constantly fueling the demand for a given platform. As noted, manufacturers can also pick up complements and integrate them in new commercial products and sell them back to consumers. Manufacturers can thus make a profitable business from identifying and mass producing user-developed innovations or developing and building new products based upon ideas drawn from such innovations. Often manufacturers choose to exploit both of the two business models. Thus, whereas modding and hacking activity is generally viewed as a source of negative spillovers (re the Digital Millennium Copyright Act) and thus as something manufacturers should protect themselves against, an innovative user community can be turned into R&D collaborators that create positive spillovers for the manufacturers of the original product. The modding process is beneficial to manufacturers under the condition that user innovation is facilitated and takes place in areas of the product where such innovation adds user value to the product and does not rob key business activities from manufacturers (Jeppesen, 2004).

### ***9.3.6 Design proposition regarding customers' contributions***

We conclude with the following design proposition concerning the contributions in each process phase that we can expect from customers when they are involved in an innovation project in the following design proposition.

**Design Proposition # 24** In deciding on the customers' contributions in the respective phases and activities of Customer Co-Creation in Innovations (**C24**) customers can contribute to innovation project activities as depicted in Table 9-3. In these contribution contexts specific interventions (**I24**) and their mechanisms (**M24**), as proposed in previous design proposition are recommended as depicted in the table, in order to obtain an effective (**O24.1**) and efficient (**O24.2**).



**Figure 9-4: Design Proposition # 24**

Innovation stage/phase	Customer contribution (Context)	Mechanisms	Intervention
Conception	Giving opinion on Strategic Planning and Requirements Analysis	(Lead) users are familiar with needs and are prone to judge solutions correctly	Delphi panel through scenarios Have customers give feedback on plans and potential markets
	Latent needs specification	People are unable to articulate unknown or latent needs, unless they can use analogies, metaphors	Special techniques like metaphor- and outcome-based communication (interviews), customer journey and netnography
	Idea generation	Customers are motivated and creative when personal benefits and challenging contributions are perceived. Customers can find solutions for their own problems, criticize existing products and services, and provide a wish list.	Traditional and modern idea generation techniques. Virtual or on-line focus groups Look for metaphors and analogies. Improve creativity by envisioning personal benefits, stating clear objectives and tasking with challenging tasks.
	Idea screening	Peer review motivates to deliver quality. Not an in-depth selection, but a selection of a large list of ideas: customers can suggest benefits, liking, purchase intent on basis of ideas	Involve other customers (community members) to screen ideas from participants.
Concept development	Defining requirements	Customers are able to evaluate requirements in the context of their use problems.	Use outcome-based approach to define requirements. Alternative tools: Consumer Idealized Design Have customer review requirements. Provide prototype or concept for evaluation
	Design	Co-designing, where customers modify, change, improve or complete the company's initial design is very common.	Have customer design his own product or service by providing design tools
Concept testing	Concept test Prototype testing	Customers are capable of identifying successful and unsuccessful concepts, provide likelihood to buy, and give feedback on performance Trying out a prototype in use context provides valuable insights on potential success of new products and services.	Concept testing Prototype testing Service testing Beta testing Usability tests

Innovation stage/phase	Customer contribution (Context)	Mechanisms	Intervention
Commercialization	Market plan development		Use online (brand) communities Customer-branding
	Advertising (tests)	Brand commitment and advocacy can lead vigilante marketing	Have customers make own commercials on e.g. YouTube Commenting on advertisement concepts
	Innovation diffusion	Customers can influence other potential users through word of mouth Customer involved creations are easier adopted than company creations.	Testimonials, recommendations Act as launching customer Sampling Member-get-member actions (Verbeke et al., 1995)
Use	Improvement suggestion Complaints Modding, hacking Supporting other users	During use customers encounter shortcomings in product or service features. Some develop their own solutions, but many complain, either formally or through word of mouth	Monitoring user communities Allow modding and hacking (to some extent) Provide base products for experiments

**Table 9-3: Customer contribution per innovation process phase**

## 9.4 The mode of co-creation: online and offline

### 9.4.1 Deciding on online or offline co-creation

Technology is of course the great enabler for customer co-creation in innovation. It is becoming easier and more cost-effective for companies to directly interact with consumers and obtain their comments. Worldwide, there are now roughly one billion Internet users according to comScore. By various estimates, anywhere from 65% to 70% of Americans already use the Internet. Additionally, market research firm Gartner, Inc. expects that by 2010 more than 60% of Fortune 1,000 companies with Websites will connect to or host some form of online community that can be utilized for customer relationship purposes. Before the Internet, businesses could still interact with their customers. However, only a few employees could interact with customers at the same time. In addition, businesses could also handle communications with individual customers and provide products. Nevertheless, it could be performed only on a limited basis. Luckily, the Internet changed everything. It allows businesses to create a high level of interactions and individualizations with customers within a range that has no boundary. However, even though Dahan & Hauser (2002) mentioned that the Internet enhances the depth and the breadth of customers' participation, businesses use the Internet only to look into customers' potential demands through the basic tool of the web page, but do not really allow customers to be involved in the process of creating product value (Chan & Lee, 2004). This situation does not correspond to the concept of "may utilize online customer communities to open new product development model", which was proposed by Kambil et al. (1999), Friesen (2001), Sawhney & Prandelli (2000) and Nambisan (2002).

Dahan and Hauser (2002) discuss the deployment of online methods to involve users and customers in the NPD-process. The capabilities or advantages of the new media are, in their view: (1) speed – a rapid interaction, involving more participants at the same time; (2) geographical reach; (3) respondent to respondent communication, where observation of the interaction is made possible to gain insights into needs; and (4) testing of virtual prototypes or concepts becomes possible. A downside of online tools is that responding time competes with work or recreational time, since the respondent is at work or at home; this could lead to a termination of participation when the respondent gets bored or fewer response than in a telephone survey.

Tacit-to-tacit exchange is greatly enhanced by close personal contact: indwelling with others, sharing common emotions and experiences, and coaxing forth an occasional deep insight (Brown & Duguid, 1998; Nonaka & Takeuchi, 1995). Thus, a recommendation could be that physical co-location and face-to-face interaction can be an important catalyst for breakthrough innovation (Holtshouse, 1998; Nonaka & Takeuchi, 1995), since much of the tacit knowledge that is shared and exchanged is accomplished through direct first hand observation, interaction with others, subtle body language, and so on. This suggestion flies in the face of the popular notion that information technology can eliminate barriers to knowledge exchange across oceans and time zones. If we accept the concept that tacit knowledge is fundamentally based on bodily experiences and emotional involvement, however, it is hard to imagine that something so personal can be digitized and downloaded. Finally, face-to-face interaction among design team members may provide an important advantage in the pursuit of breakthroughs. The more layers of insulation that exist between team members, the more likely it is that communication will be forced into explicit forms, such as documents, specifications, e-mails, memos (Mascitelli, 2000). The work of Lüthje (1999) and Gruner (1997) emphasizes that individual characteristics of the people involved has a significant influence on the eventual success of the analyzed innovation projects. The *actual form* of the user involvement and the *methodology* applied to do had however no significant influence on the innovation success (Gruner, 1997). However, with regard to appropriate patterns of interaction between users and manufacturers the analysis reveals that face-to-face-interactions are required. This is due to the nature of information that is transferred. The information provided by users and by manufacturers is highly complex. Therefore explanations and visualizations are needed to gain an understanding on either side (Lettl & Herstatt, 2004).

Van Luxemburg et al. (2002) investigate the cultural and communicative consequences of design cooperation between supplier and customer via new media. Even though literature says that face-to-face, personal contact is the best medium for technological innovation during design process (Hamfelt & Lindberg, 1987; Sivula et al., 1997), authors believe that electronic communication between supplier and customer offer good possibilities during the design process. By studying 5 SMEs that interact with their customers during design, authors show that the use of electronic communication media, compared with traditional media, result in faster transaction activities (information was sent and received faster), distances were bridged more easily, customers can be involved earlier in the design process, and fewer iterations are needed. Their conclusion is that collaborative electronic tools in design are useful for customer co-creation; the sooner in the process the better. Authors also suggest that the more supplier and customer are similar in size and professional culture, the less explicit communication needs to be, meaning that face-to-face will suffice. However, they do not prove this.

Physical, online or both as channel for participation are possible. Physical participation is preferred in situation where the firm is focusing on tacit products that have to be tested, beta-tested, and such. Choosing for an online mode of participation helps to speed up the innovation process – valuable time can be saved by not having to cover long distances or having to give everyone ‘air time’ for their input. Online applications also make process efficient: everything is already in place and does not have to be prepared or organized. Physical participation also puts a limit on the amount of participants that the firm can handle, while online participation gives limitless opportunities to involve a large crowd. The Internet offers simplified modes of interaction between producers and consumers on a large scale. Multimedia richness, global accessibility and low costs of communication and information processing facilitates the virtual integration of consumers into NPD (Dahan & Hauser, 2002; Iansiti & MacCormack, 1997). One of the conclusions we can make from this overview that question whether online or offline is for the firm to decide, based on efficiency and availability criteria. The effect will be the same, or at least,

hardly different. The magic happens when we get company members and its customers to work together, which can be online as well as offline. This implies that the innovation manager, team leader or whoever facilitates the process has to be skilled in making people from different descents work together.

**Design Proposition # 25** When co-creating with customers in innovation projects (C25), companies can choose for both an online and an offline approach, and a combination of both approaches (I25), depending on available time, amount of participants, openness of the process, innovation process stage and available resources, since these factors determine the channel use as depicted in other design propositions (M25). Both customer interaction modes contribute to a fruitful collaboration between company and customers and an effective contribution (O25).

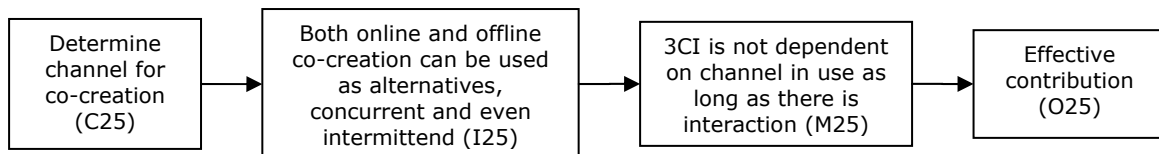


Figure 9-5: Design Proposition # 25

#### 9.4.2 Online co-creation with communities

##### Community types in innovations

Chan & Lee (2004) observe that the literature lacks a conceptual understanding on how different types of online user communities can influence the product innovation and development. In their study, "online user communities" are classified, by their characteristic of community members and interaction level, into five types: virtual customer community, beta testing volunteer corps, user content collaboration innovation community, user development community and user product collaboration innovation community. Within these online user communities, they find that (1) different online user communities can be used at different stage of product development. It is more noteworthy that "user product collaboration innovation community" can be used at all stages of the product development process, especially in design & engineer phase that is less explored in literatures. (2) firms play a supporting /complementary role within "user collaboration innovation community" in contrast to the rest online user communities.(3) there is a significant difference between the five type communities in knowledge creation, sharing and diffusion.(4) there are some implications of "user product collaboration innovation community" which pushes the firms to justify their organizational governing mechanism, in contrast to the rest online user communities (see Appendix F for a full description). We interpret these propositions as follows:

- To gather information about users, usage, product adoption, and product shortcomings or complaints, firms should make use of (existing) user communities – called *virtual customer communities* by Chan and Lee. These communities consist of all kind of users of a product (category) that interact with each other, discussing positive and negative features and experiences. Their contribution is mainly of interest in the marketing and re-innovation phase, and participants do not necessarily have to be recruited for co-creation, even though it would be polite of the firm to at least inform them of their involvement.
- However, for all other stages and activities, like e.g. needs assessment, idea generation, concept and product testing, firms can 'recruit' certain users from these customer communities, and create – when a large group is recruited or invited to participate – a so called *customer innovation community* – named *user content*



*collaboration innovation community* by Chan and Lee - in which they perform tasks or make contributions on invitation by the firm.

- To test products, concepts and prototypes of complex or technological advanced and novel products, firms should preferably involve *lead users* or advanced users that they employ in so called *beta testing volunteer corps*.
- To participate in design and development activities, firms should invite *motivated* and *capable* users from the customer community, and have them form a *customer development community*. To establish these features – motivated and capable – firms should have the invitees undergo an intake interview (Pitta & Franzak, 1996), as is done with recruitment of new employees. These users may be *lead users* or advanced users, but this is not a requirement. However, one may expect advanced users to perform more complex design or development tasks than ordinary users.

### **Tapping into communities**

To gain better understanding in communities, three essential aspects that distinguish an online community from the rest of the sites and information you can find online will be discussed (Preece, 2000). The first one is a shared purpose. This can be a common interest or need that gives the community a reason for existing. The second element is people, who interact with each other to satisfy needs. The last element is computer systems, which is the software needed to mediate the interaction. From information systems point of view, customer centric strategies require a little bit different kind of emphasis on Information Systems (IS) portfolio. The online communities and web-based designing, posting and rating tools are important in customer co-design context and even more important in open innovation context to enable cooperation in community and creation of innovations. Interestingly, the development of technology opens up new possibilities for customers to contribute in online communities. Authors are involved in research projects related to Web 2.0 and bottom-up technologies. The Web 2.0 technologies and peer-to-peer networking may radically change those information systems used between R&D and customers. Users have gained new possibilities to create content in online communities since RSS (Really Simple Syndication) format is becoming de facto in blog feeds and in notification messages ([http://rss-extensions.org/wiki/Main\\_Page](http://rss-extensions.org/wiki/Main_Page)). Wikis are used more and more in organizations. New aggregator services allow integrating RSS-based data from individual blog messages and wikis to corporate information systems. Collecting customer knowledge may in the future mean aggregating and selecting data from customer's blogs and wikis. However, the licensing and rights management solutions should support this kind of activity (Mäkipää et al., 2006).

Bonabeau (2009) states that there are several biases when generating solutions or evaluating solutions within small groups or individuals. In his opinion, collective intelligence can help mitigating the effect of those biases. He proposes three approaches to obtain collective intelligence: (1) Outreach (or crowdsourcing), as a way to get as much input as possible; (2) Additive aggregation, i.e. averaging, trends; and (3) Self organization, like Wikipedia. In order to balance in crowdsourcing diversity versus expertise Bonabeau suggests to use Delphi (traditional), but newer tools, e.g. risk profiling, as well.

Crowdsourcing can be seen as an emerging set of new business models, focusing at involving the crowd in activities such as concept development, problem solving or production (Geerts, 2009). Geerts researched literature and practice on crowdsourcing and developed, based on an analysis of the attributes on possible interventions that companies can decide on, differences in contexts in which these interventions are believed to be relevant, and outcomes that can be used to measure success, four types

of crowdsourcing. The first type is crowdcasting, in which a particular challenge is broadcasted to a crowd, generally organized as a competition with a financial reward. The second type is crowdstorming, which involves an online brainstorming session, where interaction between participants is important. In many cases, this involves a company asking the crowd for new product or service ideas. The third type is crowd production, in which the crowd creates a product or database together or creates a market of individual contributions. The fourth type is crowdfunding, where instead of the spare time, abilities and knowledge of the crowd, their spare money is used. The crowd is for example used to fund artists, companies or each other. These types all represent different business models that can be used for different purposes. Based on this typology, propositions are derived, which a company has to consider in applying crowdsourcing (Figure 9-6).

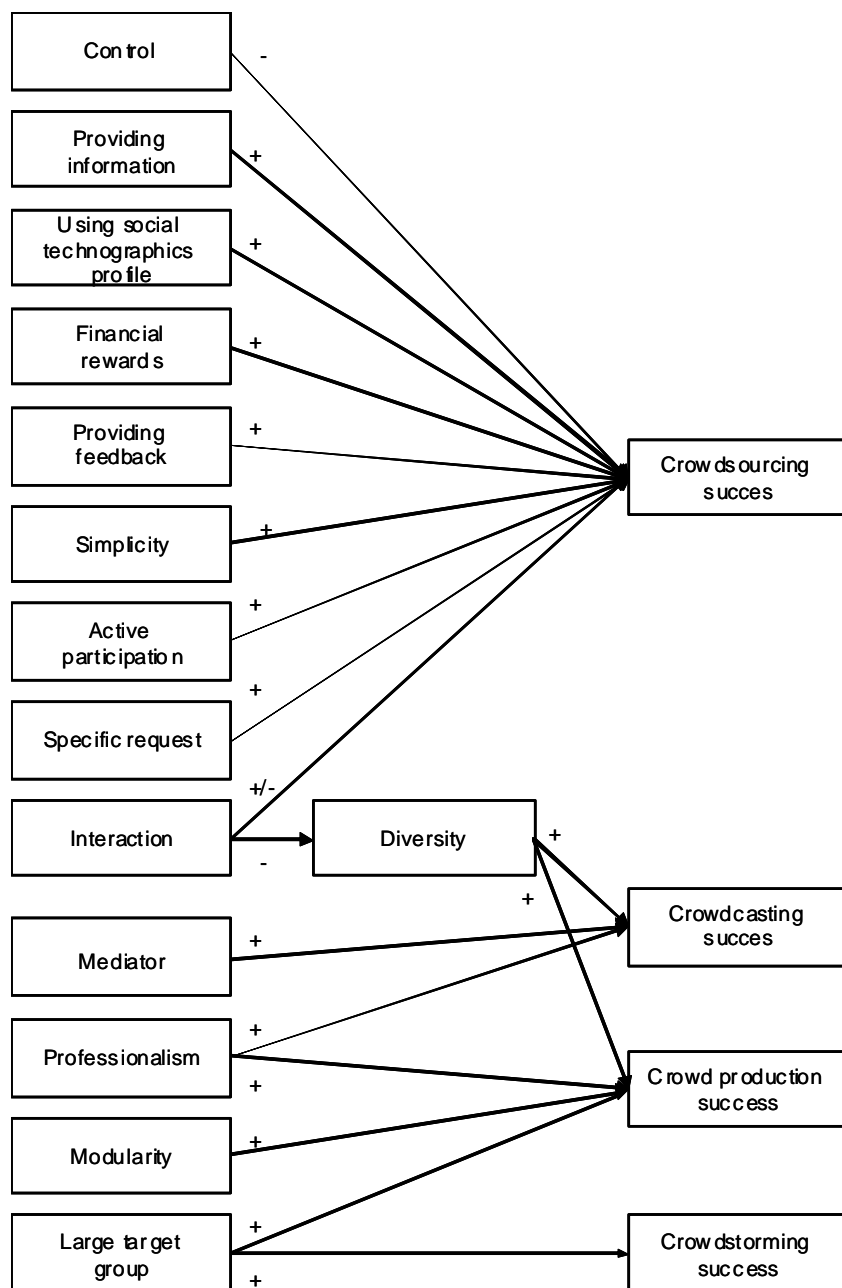


Figure 9-6: design propositions for crowdsourcing (Geerts, 2009)

The activities that have been found to require the most effort from the company are technical issues, achieving and maintaining critical mass, community management, processing results, training, and management support.

### Consequences for protocol design regarding online communities

Based on these insights we can now derive some consideration items for our protocol. First, we proposed to build or develop for customers where they can freely experiment with and comment on products, in order to elicit new ideas for innovation (Design Proposition # 5). Such a community can be created using the generic, but essential design principles we mentioned in Design Proposition # 6. The community members then can be engaged in innovation activities, based on their capabilities, competences and needs, which have been assessed through assessment techniques mentioned in section Appendix E. In order to decide which customers to engage and what contribution to expect, we create, based on Chan and Lee, Jeppesen and von Hippel, a table (Table 9-4) that tells us how to use (online) communities in the different innovation process stages.

Innovation Process Phase	Type of Community	Participants	Contribution	Firm's action
Conception/Ideation	Customer Innovation Community	General users	Needs assessment Idea generation Idea screening	Recruit/invite participants from Customer communities; Create Customer Innovation Community
Development / Implementation	Customer Development Community	General users, motivated and capable	Co-design Co-developing Commenting on designs Commenting on concepts and prototypes Concept, prototype testing	Invite participants from Customer Community. Intake on invitees Create a Customer Development community
- Testing of complicated products	Beta testing Community	Lead users or advanced users	Concept, prototype testing	Invite lead users from Customer Community Apply Lead User Approach (von Hippel) for selection
Marketing & Commercialization	Customer Community	General users	Diffusing new product (word of mouth)	Make available sample product to a mix of users.
Re-innovation	Customer Community	General users	User-user interaction and communication; User complaints and suggestions	Monitor and observe interactions and dialogues (Netnography)

**Table 9-4: Involvement of online communities**

And based on Bonabeau (2009) and Geerts (2009) we propose that, in order to reach a customer base that is likely to and motivated to participate, online approaches to involve customers should be based on crowdsourcing principles and methods, thereby preferably appealing to an already existing online community of relevant customers, users and potential customers.

### Support online involvement with toolkits

To support social interactions on an online platform, appropriate software is needed. We will call such software 'Online Toolkits'. Tools – user experience design, software architecture, shared media objects, mobile devices and data analysis are just some of the tools that enable new types of interaction. In literature, a number of tools to interact

virtually with consumers have been reviewed (Dahan & Hauser, 2002; von Hippel, 2001b; von Hippel & Katz, 2002). A McKinsey global survey of marketers shows that companies are using digital tools – from web sites to wikis – most extensively for customer service, least in pricing. Two-thirds are using digital tools for product development, almost as many as are advertising online. But only about a quarter use online tools frequently for product development, while a third thinks that it is very important to do. The reasons vary notably by industry – respondents in both financial services and manufacturing, for example, focus on testing concepts and screening ideas, while those in high tech focus on generating new ideas. Further, 31 percent of all survey respondents are using collaborative product-development tools, such as initiating discussions in blogs to test ideas, involving customers in the use of collaborative design tools, or testing how well products sell in virtual worlds. Frequent users of digital tools for all marketing purposes are much likelier than others to exploit these collaborative product-development tools. The most mentioned reason for the relatively low use of online tools is a lack of capabilities to manage them. About 20 percent host a user forum on the corporate site so consumers can help other consumers. Just over a third of all survey respondents – and just over half of those whose companies advertise online – say that their companies use some collaborative or interactive tool to advertise. About 22 percent are using these tools for customer retention, which fits into the common understanding that they help build relationships between customers and companies. Most interestingly, nearly as many respondents, 19 percent, use collaborative tools primarily for brand building (Bughin et al., 2007).

Piller and Walcher (2006) propose to use online toolkits for idea competition between users as a way to access innovative ideas and solutions from users. It builds on the nature of competition as a means to encourage users to participate at an open innovation process, to inspire their creativity, and to increase the quality of submissions. When the contest ends, submissions are evaluated by an expert panel. Winners get an award or reward, which is an exchange for the right to exploit the solution by the firm.

### **Design requirements for toolkits**

Modern internet applications, such as blogs, wikis, and social media are important in the support of customer co-creation in innovations. However, mere application is not enough. Companies have to consider specific applications to support contributions required from participating customers.

From the diversity of literature on web design, web applications, mass customization and user innovation, we can derive that tools should be based on user experience, such as ease of use, clarity, accessibility, experience (Thomke & von Hippel, 2002; von Hippel, 2001b), enable and facilitate interaction and support between customers (Ahonen et al., 2007; Constant et al., 1996; Florida, 2002; Jeppesen, 2005; Lakhani & von Hippel, 2003), provide a wide scope of solution space to encourage and facilitate user innovation and modifications (Franke & Schreier, 2002; Jeppesen, 2005; Jeppesen & Molin, 2003; Thomke, 2003). More recently there has been a push toward open standards and systems, and an attempt to make access to these tools free (Prahalad & Krishnan, 2008).

It is not our intention to design these tools, since they appear to be company, customer and context-specific. However, we can provide a framework to companies that decide to develop (or procure) such tools when undertaking the journey of customer co-creation in their innovation processes. Reichwald et al. (2005) conducted a study of literature and practice on customer co-creation in online settings to provide a framework, called the customer innovation cube (CIC,) for this. The tools are mentioned in Table 9-5.

The framework takes the innovation process phase, the customer's contribution or role, and customer characteristic (use experience) into account. Although the selected tools

are arbitrary and not specifically web based, the framework all three dimensions, which were identified as being important, when developing our previous design propositions. Therefore, all kinds of webbed customer innovation tools can be classified on a consistent basis. In this respect, we think that Virtual Customer tools described by Dahan and Hauser (2002) are better suited for this evaluation. But, company-specific applications can also be taken into account.

Survey	Test market	Lead-User Method
Reclamation Management	Community	Group Discussions
Idea Competition	Tool Kit	Brainstorming
Workshops	Configurator	Customer Idealized Design
Concept test	Open Source	Focus Groups

**Table 9-5: Tools for webbed customer innovation (Reichwald et al., 2005)**

Using the CIC, the firm has to address and answer the following questions (adapted from Reichwald et al.) to decide on the appropriateness of a given or to be developed tool:

1. Which input of the customer has been identified to be crucial for the innovation success of a company (e.g. ideas for new products, customer needs, decision about product features, testing of prototypes)?
2. Which stages of the innovation process (idea, concept, prototype and market) are affected?
3. Which customers possess the critical knowledge identified in step one in terms of their use experience (from beginner to hard user)? As the researchers found, not only lead users or advanced customers seem to be able to deliver high quality input for new product development. Also "ordinary customers" can have the competence and ability of being innovative (Reichwald et al., 2005).
4. How could the identified customers first-best deliver their knowledge regarding the different customer contributions of decision, information and creation?

Using the CIC as a classification tool and evaluating the position of a particular case within this framework demands a high degree of discussion and dialogue within either a firm or a research team helping to see the challenge of webbed customer innovation in a more structured way (Reichwald et al., 2005).

Organizations have to take into account that a toolkit can not stand by itself; many supporting activities have to be developed accordingly in order to create valuable innovations from the toolkit strategy. Jeppesen (2002), for instance, suggests that interactive consumer learning will positively affect the value of the toolkit approach. Therefore, a flexible and continually developed toolkit for user innovation that is designed properly can empower users to handle the design, the building of the prototype, and the feedback system. Furthermore, if the business practice is adapted accordingly and the toolkit allows for interactive consumer learning, the value of the designed toolkits can be greatly improved.

In the cases studied by Heiskanen et al. (2010), the interaction of communities was more important than the tools and means, but the context of the interaction and community-formation also sets the tools in a new light. Tools and tasks serve an important purpose in creating a concrete context of shared work. Participants thus gain a legitimate way to participate, if peripherally, in each others' social worlds (Lave & Wenger, 1991). Tools also serve to create shared 'mediating representations' (Hyysalo, 2003) that enable members of different groups to communicate. Thus, tools can serve to sensitize designers to users' perspectives, as well as to enable users to recognize and respond to

issues that are relevant for designers. Yet formal user involvement is merely the first 'eye-opener'. Significant commitment and alignment of interests is needed to sustain a user-inclusive innovation community (Heiskanen et al., 2010:509).

### Proposition regarding the use of toolkits

We can summarize the above discussions on toolkits with the conclusions that online toolkits can be applied to support all innovation activities conducted by customers, provided they meet some specific requirements regarding use experience, interaction features, and a wide solution space. To decide whether a tool is suited for application, we recommend using the adapted framework from Reichwald et al. (2005). When it is the company's intention to repetitively involve its customers in more innovation projects, the company should consider an online approach for as much activities as possible, in order to make the organization of customer co-creation efficient. Developing online toolkits increase this efficiency.

**Design Proposition # 26** *When appealing on (innovation) communities for innovation purposes (C26) companies have to apply crowdsourcing techniques (I26.1), tools that take the innovation phase, customer experience and expected contribution in consideration (I26.2), and community context or organization (I26.3) to maximize the obtained results (O26). Crowdsourcing enables a large and diverse reach in an efficient manner (M26.1). Appropriateness of tools can be evaluated by the adapted CIC-framework (M26.2), which asserts that contributions depend on the innovation stage, the abilities and capabilities of the participant and the required contribution. Providing the right context, i.e. the community type, is necessary since different innovation stages require different contributions and competences from participants (M26.3).*

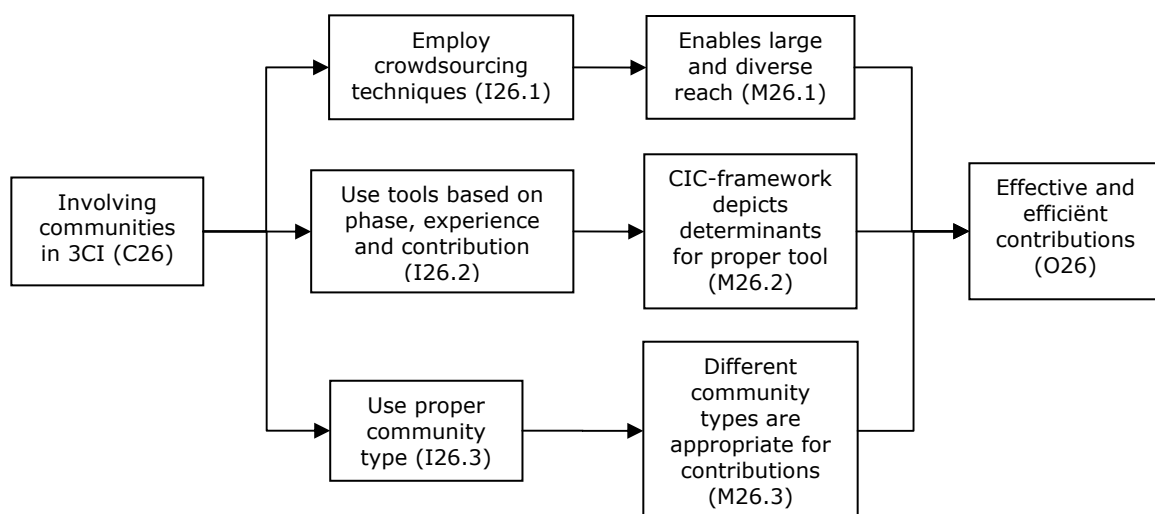


Figure 9-7: Design Proposition # 26

## 9.5 The type and intensity of the interaction

### 9.5.1 Interaction intensity

Studies in non-service environments have shown that NPD performance is considerably influenced by the quality of internal and external communication during the innovation process (Clark & Fujimoto, 1991). Studies that have addressed the issue have indicated that the effectiveness of communication (external or internal) is a critical antecedent of new service success (Brown & Eisenhardt, 1997; Lievens & Moenaert, 1994; Lievens et al., 1999). Close working relationships have been shown to be important in dynamic and

complex markets (Cannon & Perreault Jr., 1999). The quality of the relationship that is developed, and consequently the quality of interaction between developers and customers, has been shown to impact new service success (Atuahene-Gima, 1996a; Storey & Easingwood, 1996). Researchers found that relationships increased the effectiveness of NSD because they increased the frequency of contact and also the amount of information exchanged. Frequent interactions with users are more likely to lead to the development of shared norms, values, language, frame of reference, and expectations (Gales & Mansour-Cole, 1995). Frequent contacts with users may lead to reciprocal communications which may be associated with rich communication. Several studies have concluded that extensive communication with customers about new products is associated with NPD or NSD success (Atuahene-Gima, 1996a; Drew, 1995b; Frambach et al., 1998; Karkkainen et al., 2001). Even after the launch of the innovation continuous and multiple interactions are crucial, as for these can generate product improvements or user innovations (Gardiner & Rothwell, 1985; Shaw, 1983; von Hippel, 1988). In services, Brown and Eisenhardt (1997) have found that successful new service developers have frequent and direct contact with their customers. Gupta et al. (2000) have stressed that frequent and early communication between the functions of R&D and marketing with customers is particularly important for successful NSD. Gardiner and Rothwell (1985) show that early consultation of designers with tough and demanding customers in their requirements lead to more robust designs, along with the probability re-innovation and propensity for successful long term commercial exploitation.

Biemans (Biemans, 1991) found that there were several elements of user involvement, including intensity, stages, and objectives of involvement at various stages of NPD. The intensity of user-manufacturer interaction varies across stages: it tends to increase during predevelopment, during concept generation and testing it increases while interaction itself dropped, it decreases considerably during actual development, it peaks during testing, and drops again during launch. Gruner and Homburg (2000) found that a high intensity of manufacturer-customer interaction during the stages of idea generation, screening, prototype testing, and launch significantly influenced the performance of new products. They conclude that customer co-creation is important for success in the early and late stages of the NPD-process. Alam (2002) found four levels of intensity (from low to high): (1) Passive acquisition of input; (2) Information and feedback on specific issues; (3) Extensive consultation with users; (4) Representation, where customers join the NSD team as a team member. The 2<sup>nd</sup> and 3<sup>rd</sup> were the most preferred levels, but respondents found that there should be more of the 4<sup>th</sup>. But (2) and (3) were found less expensive, less time-consuming, and much easier to manage than (4). As to the stages, UI was reported to be more intense during the initial (idea generation and screening) and later stages (service design, test marketing, and commercialization), because the beginning and end were considered crucial. Service providers must go beyond manufacturer's understanding of customers, lest their offering, too, be commoditized. Even recognizing specific customers as the mass customizing manufacturer does, is not enough. The service provider must spend time interacting with customers to understand their unique needs, and then customizing the use of goods on their behalf (Gilmore & Pine, 1997). Ahmed (1998) shows that successful innovating companies have frequent interaction with their customers; there is a lot of dialogue back and forth about strategic directions and current growth markets. For instance, engineers from science laboratories were encouraged to make external visits in order to better understand market needs and use these insights to solve new customer problems. McKeen et al. (1994), however, found that user-developer communication, was positively related to user satisfaction with the new system regardless of the level of participation.

Adams et al. (1998) elaborate on some organizational learning barriers to customer involvement. One frequent excuse is that customers are difficult to predict; they often cannot express what they want, or are internally inconsistent, there are many people

with different needs involved in the purchase decision, and it is likely that what customers say now, will not be relevant by the time the product is launched. The authors view these as manifestations of more fundamental deficiencies in the processes by which new product developers learn about their markets. Learning about markets for new products can be understood as an organizational learning process involving the acquisition, dissemination, and utilization of information. Research has identified potential organizational learning barriers for the market learning processes. Authors show that because of these organizational barriers, like avoidance of ambiguity by relying on already known customer information and not trusting new market information, learning can be impeded, endangering NPD success. To overcome this, firms have to broaden the participation in the acquisition of data, e.g. by having cross-functional teams conducting customer visits (Kanter, 2001; McQuarrie, 1994), or attending focus groups. To facilitate proactive learning about customers in order to uncover latent needs, recent findings also stress customer participation in the development process or observations of customers in real action (Deszca et al., 1999; Leonard & Rayport, 1997; Martin & Horne, 1995; Matthing et al., 2004; Pitta & Franzak, 1996; Prahalad & Ramaswamy, 2000; Thomke, 2003).

Because of the complexity of the industrial products, product development should have direct connections with customers and participate closely in need assessment (Karkkainen et al., 2001). In case of radical innovation manufacturers need to identify the tacit knowledge of users to develop radical innovations (Mascitelli, 2000). In this reasoning tacit knowledge of users is considered as a key source of radical innovations (Trott, 2001). For the transfer of tacit knowledge close interactions over a longer period of time (permanent interaction pattern) are required (Leonard & Sensiper, 1998). Comprising, no unambiguous proposition can be made for the appropriate dynamic interaction pattern between users and manufacturers in radical innovation projects (Lettl & Herstatt, 2004).

Athanassopoulou and John (2004) studied which communication skills from corporate banks with their customers are of particular importance in NSD, especially between service developers and lead users. Results of this study show that firms with successful NSD: (1) are more skillful in communication with their customers than less successful companies; (2) use a wider range of communication methods, incl. new technology (email, video conferencing and virtual chats, etc.), more intensively; (3) involve more functions (R&D, production, distribution) and employees in communication directly with their customers; (4) proactively seek ideas from customers, and aim at market needs, not internal drives; (5) test market attractiveness of a new product; (6) also test final product with a small set of customers before launch; and (7) service concept and essential specifications of new product are agreed upon with customers. Less successful companies have a passive approach, await ideas, and do random idea generation. Their findings also show that highly successful developers increase their information processing capacity by using communication networks that allow many functions and employees to communicate directly with customers during NSD. As a result, highly successful developers manage to match information processing requirements and capacity and this will help in enhancing their performance in NSD. Analysis of data collected on the NSD process revealed that although the NPD and marketing departments are important in the first and last stages of the NSD process, multifunctional teams of specialists come in direct contact with customers especially at the development stage where the specifications of the new product are decided. At this stage customer information is critical to assure new product acceptance.

Wheelwright and Clark (1992b) describe an organizational design to reduce uncertainty and equivocality by integration as integrated problem solving, which includes the early involvement of constituents who belong to a cross-functional team that works on different phases of product development concurrently. This integration includes internal



and external participants (Pitta & Franzak, 1996), and it links upstream and downstream groups in time and in the pattern of communication. Bailetti and Guild (1991) study the effect of bringing product designers into direct contact with outside sources of knowledge, like lead users. Designers participating in this study formulated several benefits, like a more productive and creative process for formulating new product opportunities, a greater commitment to agreed-upon solutions, a greater business perspective for technology solutions, and the development of stronger linkages with outside sources.

An important question in managing developer-customer communication is who on the developer side needs to be involved. Cooper (1987) has supported the notion that there is a need to include more than one supplier department in the NPD process. Duncan and Moriarty (1998) and Athaide and Stump (1999) have stressed that the value of feedback is realized 'when distributed', that is to say, information from customers has to be passed comprehensively to all stakeholders in the supplier organization. Hargadon & Sutton (2000) assert that successful developers have been found to 'spread information and ideas throughout their organization'. Akamavi et al. (1998b) postulate that effective NPD requires the input and active participation of players from many different functions of the supplier organization. To accomplish this spread of information to all involved in NPD or NSD in an optimal way, implies the exposure of these NPD or NSD participants directly to the participating customer. The successful collection of information from customers and its spread throughout the developer organization can be achieved by the use of multi-functional teams (Bacon et al., 1994; Cooper & Kleinschmidt, 1994; Page, 1993). The importance of using cross-functional teams in NPD and of the collaboration and integration between the different supplier departments is widely emphasized in the literature (Gupta et al., 1986; Ruekert & Walker, 1987). Tomes et al. (1996), and supported by Pitta and Franzak (1996), argue that effective development entails the involvement of users in NPD processes by enlisting them as designers, by which is meant that users should be in direct and active contact with designers instead of having the marketing department communicate the user needs from market research, which is regarded a passive way of participation. For this they suggest several modes of participation, like semi-structured interviews of users by designers, design team meetings with the customer, exchange in informal settings like lunches, breaks, where needs are also ventilated by users, inviting user critique of product proposals before, and making users acquainted with design limits and trade-offs by showing them the thinking behind the designs. To accomplish this, they conclude that the management of such a process should be executed with caution and expertise, by creating trust and credibility through the demonstration of competency, understanding and sympathy with users' needs and proper group dynamic process management. This of course requires proper skills from the design team manager.

Therefore, it can be argued that the use of communication methods that allow many functions of the organization, or many people within the organization to communicate with customers, helps the rapid dissemination of information and decreases NPD time. Co-location (physical and virtual) is regarded as one of the most important factors that enhance this dissemination (Song et al., 2007; van der Bij et al., 2003). Brown and Duguid (1991) note that 'joining a community (of practice) gives access to that community's identity and through that its collective knowledge'. Having users as permanent and fully authorized members of the product development team thus enables companies to surmount some of the 'stickiness' (von Hippel, 1998) of user and producer knowledge. These findings suggest that companies should maintain an intensive communication with their customers during all stages of the innovation process, and should also consider including them in NPD or NSD teams (Alam, 2006b; Rothwell & Gardiner, 1983), or at least having NPD team members or R&D interact directly with customers (Frosch, 1996; Leonard, 1999). On this dimension we observe modes where

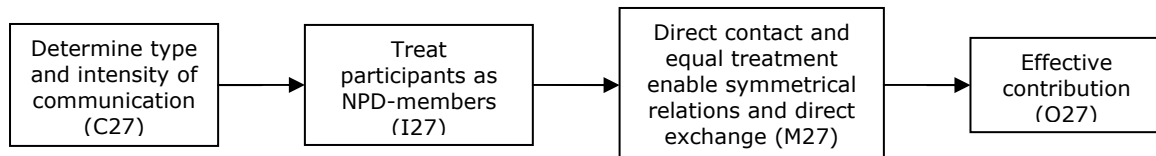
participants get to become (almost) members of the development team, by attending meetings, participating in brainstorm sessions, co-deciding on prototypes, and such, whereas there are modes where the 'distance' between team and participants is large. Participating customers thus become 'partial employees' as is suggested in service delivery theories (Bowen, 1986; Kelley et al., 1990; Lovelock & Young, 1979; Mills et al., 1983; Mills & Morris, 1986). On the other hand, they shouldn't be managed as ordinary employees, since their contributions are of a voluntary and creative kind which need other motivational interventions than hierarchy and financial rewards (Florida, 2002). Having customers become members of the design or NPD team prevents misalignments or unwanted adaptations in product or customer context when the product is released for use (Leonard-Barton, 1988). However, a common feature of the successful approaches is that development team members have direct contact with participating customers (Anderson & Crocca, 1993; Boland, 1978; Comer & Zirger, 1997; Lundkvist & Yakhlef, 2004; Nambisan, 2002; Sanders & Stappers, 2008; Sisler & Titta, 2001; Tomes et al., 1996), i.e. not having the marketing department (Holt, 1988; Leonard, 1999; Macdonald, 1995; Malhotra et al., 1996; Workman, 1993) or a third party (Campanelli, 1993) as a principal intermediary, or by having marketing and customers take place in the cross-functional team (Alam & Perry, 2002; Lagrosen, 2005; Pitta et al., 1996). Participating customers thus become members of the development team (Evans, 1996; Lewis, 1995; Neale & Corkindale, 1998) by enlisting them as designers, in order to establish trust and credibility, manage expressions of user need, making customers acquainted with design limits and the thinking behind the design (Tomes et al., 1996). Communication and relations can even go beyond standard business conversations, as is illustrated by Tomes et al. and Anderson and Crocca (1993). The latter research relays on the development of a document system for a library, where the development team recognized the need to involve the users from the beginning in all planning and development activities. This was seen as a way to explore and discover requirements, while building working relationships among users and engineering-team members. Open and continuous feedback between users and engineers was necessary to support an iterative, evolutionary development, delivery, and evaluation process. One of the key observations from this project is that without personal relationships no co-development is possible, and that time must be spent in nurturing working relationships (Anderson & Crocca, 1993).

The use of new technology is a particularly important issue in developer-customer communication. New communication technology has transformed the way suppliers interact with customers in terms of quality, extent and frequency of information exchange. The advantages of cost and timeliness resulting from the use of new communication technology can create a competitive advantage for pioneer users (Campbell & Cooper, 1999; Leibs, 1998). Developers have been shown to embrace new technology as a means for more effective communication with customers (Calabrese, 1997; Korzeniowski, 1999). Broadcast fax, informational CD-ROMs provided on the Web, interactive Web sites, Webcasting, streaming audio, and virtual chats are all examples of the types of new technology now being used.

Note that distance is not only a matter of physical distance. Distance, both physical separation and time, renders sharing the tacit dimensions of knowledge difficult. Much knowledge is generated and transferred through body language, physical demonstration of skills, or two- and three-dimensional prototypes that can be interactively shaped by a group of people (Leonard & Sensiper, 1998). Although there are authors who state in technological innovations that face-to-face, personal contact is the best medium during the design process (Holtshouse, 1998; Lewis, 1995; Nonaka & Takeuchi, 1995), others propagate that electronic communication between members offer excellent possibilities during this design process (Bae, 2008; Van Luxemburg et al., 2002). In the end, empirical evidence shows that physical co-location and IT support for knowledge

dissemination interact and strengthen each other (Song et al., 2007), which means that both modes of communication should be deployed.

**Design Proposition # 27** *In determining the appropriate type and intensity of communication between firm and the participants (C27), the firm should treat the customers as NPD/NSD team members (I27) to obtain an effective contribution (O27), because direct contact with team members and equal treatment make relation as symmetrical and direct as possible enabling quicker, more and better exchange of ideas and contributions, without inhibitions (M27).*



**Figure 9-8: Design Proposition # 27**

### 9.5.2 Type of interaction: common language

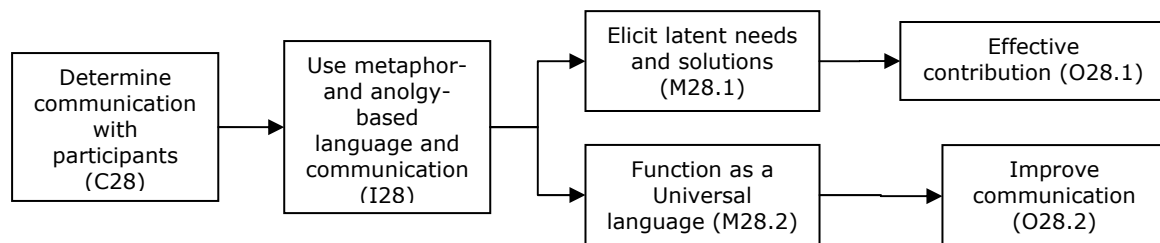
However, cultural, language, and social differences between the company and its customers could be factors that affect this so-called distance. Van Luxemburg et al. (2002) suggest that the more supplier and customer are similar in size and professional culture, the less explicit communication needs to be. In such industrial and technological contexts, language and social differences will most probably not be relevant, contrary to B2C situations. Language, in that case, does not necessarily mean linguistic differences alone, but jargon as well - companies, developers and designers are used to a professional language that consumers, and sometimes industrial customers as well, do not necessarily understand, regardless of the medium being used (Wagner & Hayashi, 1994). In addition, customer involvement usually implies that customers are seen as a resource for the firm, from which knowledge is detached from its context and made explicit in language, reducing its richness (Lundkvist & Yakhlef, 2004). The authors therefore suggest viewing customer co-creation as a conversation, a rich mode of interaction that includes an agential dimension. In innovation-related activities the conversation consists of various suggestions, feedback and ideas customers and the firm's employees jointly construct new ideas during the conversation (Boland, 1978). Anderson and Crocca (1993) encountered the problem that communication was hampered by the idiosyncratic language and acronyms common to the two professions and organizations of which the customer and the provider consist.

The development of customer co-creation faces serious barriers, i.e. circumstance that impede or even prevent a timely, purposeful, and/or continued interchange between firm and customer (Ritter & Walter, 2003). Diverse languages, group think, and/or mismatch in coding schemes as well as protectionism of core competencies might act as communication impediments (Rubenstein & Ettlie, 1979).

So, there is a need for a common language between team members and customers, to prevent failure of the innovation because of these language and social differences. It also necessary to think about the communication or 'language' that the team has with others outside the team, e.g. senior management, production, and such, or new members - this latter specifically referring to the recommendation we gave in Design Proposition # 23 about alternating participation through project phases. Albinsson (2005) proposes the use of metaphors and scenarios, Brandt et al. (2008) suggest the use of games, Abma (2003) introduces storytelling as a means to communicate - confirmed by Brown and Duguid (1991) - , Sifonis et al. (2006) and Herstatt and Kalogerakis (2005) find their

solution in the use of analogies, making it rather confusing for firms to choose the right 'language'. We can, however, rely on a broad body of knowledge about the potential that the use of metaphors and analogies in creativity tasks, new product development, problem solving and knowledge transfer (Dahl & Moreau, 2002; Fauconnier & Turner, 1998; Gentner & Markman, 1997; Gick & Holyoak, 1980; Goel, 1997; Indurkha, 2007; Milligan & Rogers, 2006; Oppenheimer, 2005; Teichert et al., 2006; Ward, 1994; Ward et al., 2004; Zaltman & Zaltman, 2008), see Appendix G, that we will propose our 'language to use' in our protocol design:

**Design Proposition # 28** *To communicate with and between participants in innovation activities (C28) it is recommended to use a language based on metaphors, analogies and symbols (I28) to increase the creativity of participants and quality of solutions (O28.1), as well as the quality of understanding between company stakeholders and participating customers (O28.2). Metaphors, analogies and symbols enable the expression of latent and unconscious needs, requirements, solutions, and such (M28.1) and function as a universal language to bridge different (sub-) cultures (M28.2).*



**Figure 9-9: Design Proposition # 28**

Appropriate tools, methods and techniques were discussed and incorporated in the development of our design propositions. But, how about the suitability of innovation process tools in use by the company? Our previous reviews (sections 2.8 and 4.4.5) in combination with our description of the 3CI modes (4.5 through 4.12) lead to the observation that the majority of tools, techniques and methods that are typically used in innovation projects without an active and intentional customer involvement, can also be used in innovation projects where customers are actively involved in the project to execute process activities. Companies do not have to look around for alternatives. Participation of customers may require that these participants also apply these tools and techniques (Design Proposition # 4), since they are capable of fulfilling the same roles as innovation team members (Design Proposition # 27). So, when participating customers are required to use these tools as well, companies have to consider training of the participants, since it is not evident that customers know how to apply such tools (see Design Proposition # 16). We will therefore refrain from translating this in a Design Proposition.

## 9.6 Summary and design consequences

Based on several studies we have reviewed aspects of the process of 3CI. We have seen that all innovation process phases can benefit from 3CI, with the notion that the sooner the customer is involved, the better this is in acquiring effective and efficient customer contributions. Online involvement also seems to be possible in all situations, provided that contributions entail transmittable knowledge and information. From all these studies it also became obvious that direct contact between NPD team members and participants is beneficial to the success of the project (Tomes et al., 1996). For instance, a Swedish study in the telecom services shows that ordinary users might produce better ideas than

professional designers, but these ideas are usually of a low producibility; on the other hand, consultation of designers by these users increases the producibility of the ideas (Magnusson et al., 2003). In that consultation or interaction it is crucial for the success of the NPD that team members really understand the latent and unarticulated needs and wants of the customers (Magnusson et al., 2003; Mullins, 2007). But, similarly, it has been elaborated that customer-to-customer communication seems to be another important premise to a successful customer co-creation. (Online) communities provide the opportunity for customers to freely exchange ideas and support, from which companies can benefit in developing innovations. Using metaphors and analogies to name places, events, rituals in such communities increase the attractiveness for customers to participate (Kim, 2000).

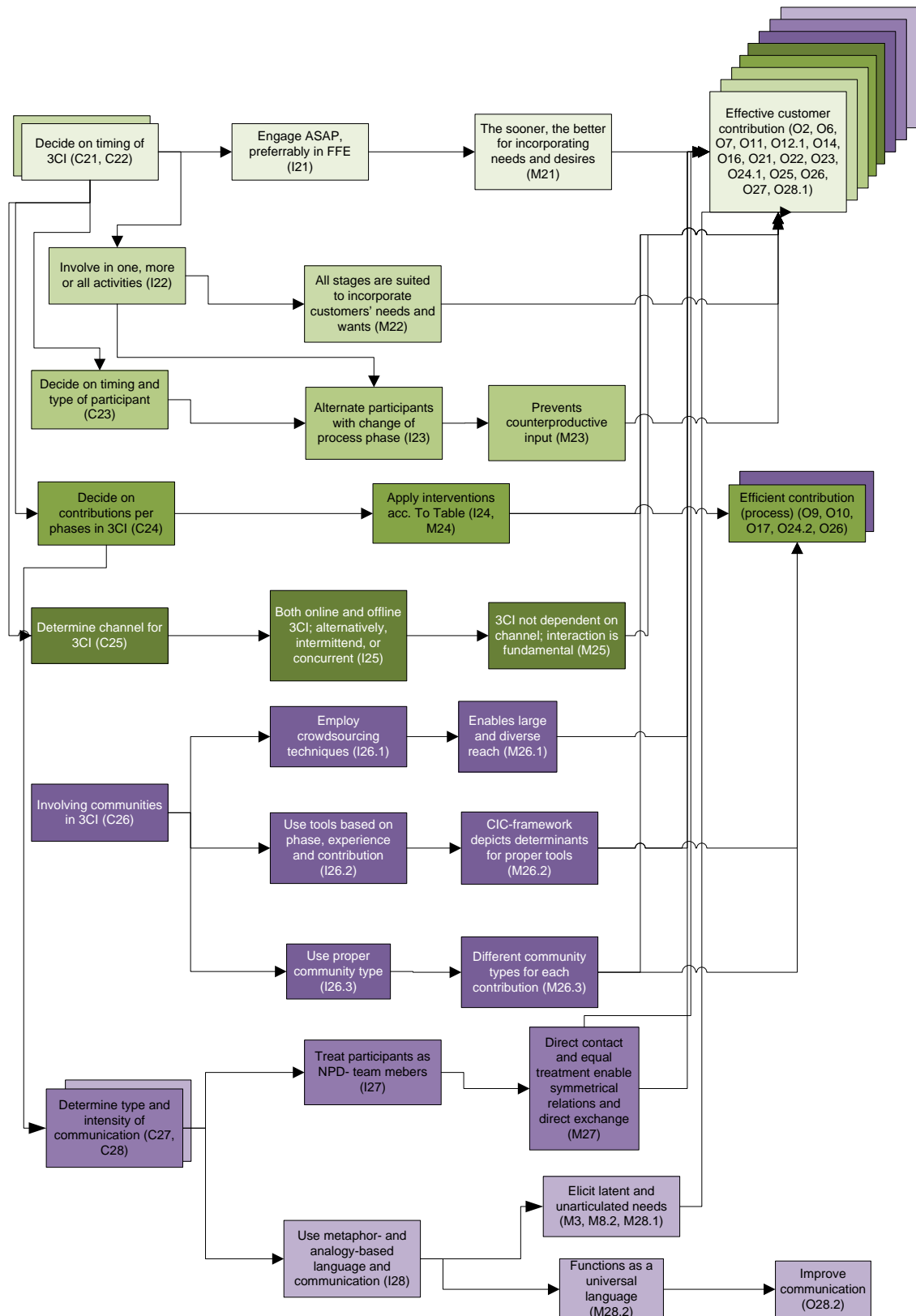
To accomplish an understandable dialogue with and between customers numerous research proves that qualitative techniques like customer interviews (Buber et al., 2004; McCracken, 1988; Zaltman, 2003), and the use of metaphors and analogies throughout the whole NPD improves understanding and communication, increasing the success of the NPD (Herstatt & Kalogerakis, 2005; Sifonis et al., 2006; Teichert et al., 2006; Zaltman, 2003). Based on all these findings it can be concluded that tools and techniques that facilitate a dialogue or an interaction between participating customers and company's NPD-team (Lundkvist & Yakhlef, 2004), and the use of metaphors and analogies are likely to be suited to support the customer co-creation because:

- customers might use metaphors and analogies to express their feelings (Zaltman, 2003);
- unspoken, latent needs can be elicited (Mullins, 2007);
- a common vocabulary can be created that can be used for communicating ideas and concepts (Sifonis et al., 2006), enabling outsiders to understand what is intended – changes in participants can be made without loss of information, thus hardly affecting the speed of the process.

## 9.7 Conclusion to this chapter

To our initial 20 design propositions we have added an additional 8 design propositions, in this chapter regarding the process of co-creation. We have seen that all innovation stages are suited to co-create with customers. For the appropriate activities in which these customers can contribute we have developed a table depicting activities and contributions per innovation stage. Co-creation can take place in one, more or all stages; to receive the most benefit, customers should be involved as early as possible in the innovation process. To ensure diversity in input, to prevent loss of attention, demotivation and premature abandonment, we have proposed to change participants with ongoing activities; relying on the same customers in all stages can result in 'myopic' results. Both online and offline involvement are possible, depending on openness, innovation stage, amount of participants and available resources. If participation is online, we recommend applying crowdsourcing methods and techniques, preferably within the customer community. To support an effective communication, we finally proposed to use metaphor or analogy based 'language' and to treat the participants as if they were team members.

Similar to the two previous chapters we again combine all 28 design propositions in one synthesized diagram, see Appendix H).



**Figure 9-10: Synthesis of Process Design Propositions**

# Chapter 10 Protocol Design

## 10.1 Introduction to chapter 10

Based on the accumulated design propositions that have been derived from the analysis in the previous chapters, we now can construct the intended protocol, which is the purpose of this research. First we will give an overview of the design propositions which we have identified as relevant for the protocol (Section 10.2). Next (Section 10.3) we will check the compliance of these propositions with the previously set design requirements, see Chapter 6. Then we will present the outline of the protocol where we will present a four route approach for 3CI (Section 10.4), followed by a description of each route in the protocol (Sections 10.5 through 10.8). In this elaboration we will also present some alternatives for the given 'prescriptions'. We conclude the chapter with a discussion of a summary and preview on the validation (Section 10.9).

Note that this chapter is a *total representation* of our design *before* validation. That means that it is not adapted yet to comments and improvement suggestions from the validation panel. It also contains elements, like the design propositions, the compliance of propositions with design requirements and chapter conclusion, which are not a standard part of the protocol. We will therefore refer to this protocol as version 0. The adapted 3CI-protocol, which we will tag version 1.0 is presented on page 3950.

## 10.2 Overview and synthesis of design propositions

In the previous chapters (6.1 through Chapter 9) we have derived several (28) design propositions for the protocol. All together they shape the protocol, but have to be put in perspective with each other.

The resulting propositions can be listed as follows:

Design Proposition #	Proposition text
Design Proposition # 1	Companies that are willing to and looking for proper ways to co-create with their customers in the innovation process (C1) can apply the 3CI-protocol (I1), because this protocol provides the appropriate routes and actions (M1) that lead to an effective input from customers (O1), needed to enhance the effectiveness (O1.1) and efficiency of the innovation process (O1.2). Process effectiveness is enhanced because (1) the innovation outcome is a product or service that is what customers want; (2) the innovation will be adopted quicker than without involvement; and, (3) being involved make customers more loyal to the firm. Efficiency is enhanced, because (1) R&D costs will decrease; and (2) innovation development speed increases.
Design Proposition # 2	In determining the proper innovation strategy for co-creating with customers in the innovation process (C2) companies should implement and maintain a market orientation, in particular a customer orientation (I2), because such an orientation aims at obtaining a deep understanding and increasing the knowledge about and from the customer (M2) that can lead to an effective contribution of customers (O2).
Design Proposition # 3	To support the development and maintenance of a customer orientation (C3), companies have to apply customer listening techniques, also known as Customer Knowledge Management (I3), such as ZMET™, outcome based methods and customer journeys, to properly understand customer needs and wants (O3), since these techniques go beyond traditional market research techniques and elicit latent and unarticulated needs and wants of customers (M3).

Design Proposition #	Proposition text
Design Proposition # 4	In determining whether the firm is suited for 3CI in the context of its industry, market maturity and type (C4), any organization, regardless of the sector it operates in, the type of product it produces (goods, services) and type of market (B2B, B2C) can co-create with its customers in innovations (I4.1), provided that the participants are given sufficient influence, power and tools to make contributions (I4.2) and the firm is authentic and transparent in its appeal (I4.3). Because contemporary users' motivation and attitude to exert control over firm's offerings (M4.1), the perception of receiving personal benefits through participation (M4.2), and the perception of the firm as trustworthy and credible (M4.3) are enabled and catalyzed by modern technological applications and the firm's benevolence, customers are empowered to participate in 3CI effectively (O4).
Design Proposition # 5	When looking for customer-initiated innovation ideas and contributions (C5) the firm has to create, maintain and support a user/customer community (I5.1) in which customers are/have been provided a base product or service (I5.2), with which they can freely experiment to re-innovate (M5.1), and where they can freely exchange and reveal (M5.2) their ideas, suggestions, and modifications to each other and the firm, which they deem necessary and beneficial to themselves, the community and the firm.
Design Proposition # 6	In creating and maintaining (online) innovation communities (C6) firms should consider design principles as giving and communicating purpose (I6.1), creating a dialogue through feedback and acknowledgement on contributions (I6.2), facilitating and encouraging customer-to-customer interaction (I6.3), distinguishing different and evolving roles (I6.4), keeping track of customer identities and contributions (I6.5), educating new participants (I6.6), and providing appropriate tools for contributions (I6.7) to achieve an active and productive community contribution (O6). These interventions (I6.1 – I6.7) in conjunction make transparent to participants what is expected from them (M6.1), give meaning to their contribution (M6.2), intrinsically motivates participation when a contribution is acknowledged and recognized (M6.3), create trust between members and between members and company through visibility and credibility (M6.4), make participants feel in control of their activities when educated and provided with tools (M6.5), and enable a proper appeal on contributions with consideration of an individual's abilities and previous achievements (M6.6).
Design Proposition # 7	Companies that want to co-create with their customers in a company-initiated innovation project (C7), should aim for an active participation (I7), i.e. informing the participants about the purpose, what is requested from them, procedures to be followed, and how the firm intends to use their contribution, because transparency removes barriers or inhibitions to participate, resulting in motivated, committed and satisfied participants (M7), so the most effective input will be acquired from participants (O7).
Design Proposition # 8	In determining the type of innovation, suited for customer co-creation (C8) the application of traditional market research and customer involvement tools (I8.1) are likely to lead to (at least) incremental innovation (O8.1), because the tools are suited to elicit customer articulated and identifiable needs that lead to minor or incremental improvement to existing products and services (M8.1). To involve customers in incremental or sustained product, service and process innovations, adopting a customer orientation (I8.1), are the minimum requirements to warrant an effective customer input (O8), since these are the most suitable orientation and tools to effectively involve customers in innovations (M8). Application of customer listening methods, such as the outcome-driven approach, the metaphor-based interview, customer journey approach and/or netnography in the front end of the innovation process (I8.2) will more likely lead to really novel and radical innovations (O8.2) since these methods are capable of gaining access to tacit customer knowledge and ideas (M8.2), which are needed to develop a customer-centered radical or breakthrough innovation.
Design Proposition # 9	In determining the 'openness' of the 3CI-innovation (C9) firms should choose for the 'closed mode' of involvement (I9.1) when they have a clear scope of the innovation deliverables in terms of a concept, prototype or test ready product (C9.1) – thus typically in the implementation stage of the innovation - , a clearly defined and known market or customer, for which the innovation is specifically



Design Proposition #	Proposition text
	intended (C9.2), and IP-protection or non disclosure for competitors is needed (C9.3), because these conditions will limit the amount and diversity of participants to a necessary minimum (M9) , which is needed to ensure secrecy or closure throughout the innovation, in order for the firm to efficiently obtain the most relevant, specific and useful customer input for the innovation (O9).
Design Proposition # 10	When the innovation scope is unclear – typical in the conception and re-innovation stages of the innovation process - , the intended market unknown and project disclosure poses no problem (C10) firms can choose for the 'open mode' of 3CI (I10). In order to manage customer input efficiently (O10) for a 'totally open mode' involvement of customers, firms have to reserve sufficient resources (I10.1), divide the required customer contribution in 'digestible' and independent chunks for participants (I10.2), and engage participants through online and virtual channels (I10.3) because these actions enable the participation and management of a large group of participants (M10).
Design Proposition # 11	To decide on the type of customer to co-create with (C11), participating customers should be selected on their affinity with the domain in which the innovation will take place, meaning that they should have some experience in being a user of the product or service class (I11), so the firm can expect relevant and good input (O11). In this respect it is not necessary for the users to be an active or existing customer of the innovating firm. Experience with the domain is necessary, because only then will participants be able to perceive possible benefits from product or service improvements in the context of its use (M11).
Design Proposition # 12	In determining the technical expertise for Customer Co-Creation in Innovations (C12.1), firms can involve any customer that uses, has used or will potentially use the innovation or a related product (category), regardless of their technology skills or know-how (I12.1), since all (potential) customers are sufficiently knowledgeable (M12.1) to effectively contribute to the innovation process (O12.1), whether they are lead users or ordinary users. In the case of radical innovations in high-technology industries (C12.2) firms might consider a certain additional representation of lead customers/users (I12.2) to increase the chance on a really novel or radical innovation (O12.2), since lead customers are considered innovative and ahead of the market in the field of innovation (M12.2).
Design Proposition # 13	To find lead users in (online) customers communities (C13, O13), which can contribute in radical innovations (see Design Proposition # 12), the firm should observe and appeal on the whole community to identify motivated and capable participants (I13), since community members are knowledgeable about the community's lead users (M13).
Design Proposition # 14	In selecting and engaging the participants to participate in Customer Co-Creation in Innovations (C14), companies can increase the effectiveness of their contributions (O14) by screening and selecting potential participants on their motivation and willingness to participate (I14) because intrinsically motivated and voluntary participants are capable of more creative and relevant contributions than others (M14).
Design Proposition # 15	When appealing on customer creativity in suggesting new product ideas or improvements (C15), firms should have other users and customers, which take part in the customer innovation community, to assist in the screening and assessment of the ideas (I15) in order to increase originality, novelty and creativity from the participants (O15), because creativity is highly determined by the social context it takes place in (M15).
Design Proposition # 16	In selecting and engaging the participants to participate in Customer Co-Creation in Innovations (C16), companies can increase the quality of their contributions (O16) by giving participants some training related to the contributions that are expected from them, the tools and techniques to be used, and interpersonal skills (I16) since these will increase the participants' perception of their capabilities to contribute and inherently their intrinsic motivation and willingness to participate (M16).
Design Proposition # 17	In determining the amount of participants in Customer Co-Creation in Innovations

Design Proposition #	Proposition text
	(C17), firms should aim at involving a maximum amount of participants in the early (conception) and last (re-innovation) stages of the innovation process through online channels (crowdsourcing) (I17.1) because many and diverse input is needed in these stages (problem solving) but where the maximum amount is dependent of what the firm can handle, given the chosen strategy regarding time, channel and global reach (M17.1). During the implementation and start of the commercialization stage a minimum amount of participants should be aimed at 15 participants, preferably physically present, per phase (I17.2), since this amount assures a representative quantitative view of possible customer inputs and limits the resources (prototypes, test versions) needed (M17.2). This ensures an efficient contribution (O17).
Design Proposition # 18	For firms that need to engage and motivate participation (C18) and ensure commitment throughout participation (O18), the assigned task for the participating customers has to be meaningful, challenging and relatively complex to them (I18.1), while its goals should be clearly specified (I18.2). By means of knowing what is expected from them (Design Proposition # 7) and the feeling of being in control (Design Proposition # 4) participating customers can assess the relevant valence emerging from their efforts, which is needed to feel motivated to perform (M18).
Design Proposition # 19	To motivate customers (C19, O19), which are involved in the innovation co-creation process (C19) into participating, no monetary reward has to be made in foresight (I19.1), whether on participating or completing the task, because this may undermine the intrinsic motivation that people may have for participating (M19.1). When monetary payments are promised and given (I19.2), these should preferably be administered contingent on the task complexity and the performance shown, since participants feel compensated for valuable time, costs and effort spent in participation and possible exchange of the right to exploit the solution by the firm (IPR), because these will be perceived as a recognition of one's abilities and commitment (M19.2).
Design Proposition # 20	When co-creating with customers in innovations in the front end activities like needs assessment, idea generation, and idea screening, design and concept development (C20), it would be better for the creativity of the participants (O13) not to promise any monetary rewards at all in advance (I20.1), and to reward participants unexpectedly with intangible rewards (I20.2), because the expectancy of a monetary reward may reduce intrinsic motivation and creativity (M20).
Design Proposition # 21	In deciding on the timing of Customer Co-Creation in Innovations (C21), the firm should aim at involving its customers in an early stage, preferably at the start of the innovation process (I21), to increase the effectiveness of customer input in order to achieve the greater chance for success (O21), as customers' wants and needs are more likely to be incorporated in the innovation (M21).
Design Proposition # 22	In deciding on the timing of Customer Co-Creation in Innovations (C22), all innovation stages, phases and activities are suited to co-create with customers (M22) so firms can decide on co-creating with customers in only one, more, but preferably all stages and activities (I22) to achieve an innovation that is needed by the customers (O22).
Design Proposition # 23	In deciding on the participants in the different phases of Customer Co-Creation in Innovations (C23), firms that intend to involve the customer in more than one stages should avoid involving the same customer(s) in all these stages and should try to alternate customers per phase (I23), since involvement of the same customer(s) can lead to several counterproductive actions from these customers (M23) that may prove to be detrimental to an effective contribution (O23).
Design Proposition # 24	In deciding on the customers' contributions in the respective phases and activities of Customer Co-Creation in Innovations (C24) customers can contribute to innovation project activities as depicted in Table 9-3. In these contribution contexts specific interventions (I24) and their mechanisms (M24), as proposed in previous design proposition are recommended as depicted in the table, in order to obtain an effective (O24.1) and efficient (O24.2).

Design Proposition #	Proposition text
Design Proposition # 25	When co-creating with customers in innovation projects (C25), companies can choose for both an online and an offline approach, and a combination of both approaches (I25), depending on available time, amount of participants, openness of the process, innovation process stage and available resources, since these factors determine the channel use as depicted in other design propositions (M25). Both customer interaction modes contribute to a fruitful collaboration between company and customers and an effective contribution (O25).
Design Proposition # 26	When appealing on (innovation) communities for innovation purposes (C26) companies have to apply crowdsourcing techniques (I26.1), tools that take the innovation phase, customer experience and expected contribution in consideration (I26.2), and community context or organization (I26.3) to maximize the obtained results (O26). Crowdsourcing enables a large and diverse reach in an efficient manner (M26.1). Appropriateness of tools can be evaluated by the adapted CIC-framework (M26.2), which asserts that contributions depend on the innovation stage, the abilities and capabilities of the participant and the required contribution. Providing the right context, i.e. the community type, is necessary since different innovation stages require different contributions and competences from participants (M26.3).
Design Proposition # 27	In determining the appropriate type and intensity of communication between firm and the participants (C27), the firm should treat the customers as NPD/NSD team members (I27) to obtain an effective contribution (O27), because direct contact with team members and equal treatment make relation as symmetrical and direct as possible enabling quicker, more and better exchange of ideas and contributions, without inhibitions (M27).
Design Proposition # 28	To communicate with and between participants in innovation activities (C28) it is recommended to use a language based on metaphors, analogies and symbols (I28) to increase the creativity of participants and quality of solutions (O28.1), as well as the quality of understanding between company stakeholders and participating customers (O28.2). Metaphors, analogies and symbols enable the expression of latent and unconscious needs, requirements, solutions, and such (M28.1) and function as a universal language to bridge different (sub-) cultures (M28.2).

**Table 10-1: 28 design propositions crafting the Weber3CI protocol**

The schematic diagrams, presented in the 3 previous chapters (Figure 7-12, Figure 8-12 and Figure 9-10) can also be joined, representing all design propositions. This overall synthesis of schemas is presented in Appendix G. It contains a very complicated schema, with a lot of detail, making a fast interpretation and comprehension rather difficult. To avoid this problem we adjusted and aggregated the schema to a less complicated and easy to follow one, as represented in the second diagram in the Appendix.

As we can now see, the firm that wants to apply the protocol has certain degrees of freedom in its application. These degrees of freedom reflect decisions to be made about – assuming that the firm is customer oriented and mature enough for 3CI – the sourcing of ideas for the innovation, the type and openness of the innovation, the type and amount of participating customers, the timing of the involvement, and the channel of involvement. To make such decisions effectively, we need to provide the necessary criterions, which we will address in sub-section 10.4.3

### 10.3 Compliance of design propositions with requirements

We can now check for the compliance of the design propositions with the defined design requirements of Chapter 6. This is depicted in Table 10-2, where we also give references to the relevant sections where compliance is achieved.

Requirement class	Requirement #	Description of requirement	Compliant with Design Proposition #	Reference theoretical section(s)	Reference protocol section(s)
Functional requirements	# 1	The protocol has to specify the type of customer to be involved in co-creation.	Design Proposition # 11	8.2.2	10.4.2
	# 2	The protocol has to lead to effective and efficient innovation processes.	Design Proposition # 1	4.4.3	10.4.4
	# 3	The protocol is intended for situations where the firm intends to premeditatedly involve its customers in co-creation in innovations.	Design Proposition # 1	4.4	10.4.2
	# 4	The protocol has to be applicable for all sectors, products and innovation types by distinguishing their particular characteristics.	Design Proposition # 4	7.1	10.4.3
	# 5	Criteria have to be given to decide whether a particular given innovation project is suited for customer co-creation or not.	Design Proposition # 2, Design Proposition # 4, Design Proposition # 8 - Design Proposition # 10	7.1, 7.3, 7.4	10.4.3
	# 6	The protocol should tell who to involve (requirement for the participating customer), when (process phase), and how (contributions and tools).	Design Proposition # 3, Design Proposition # 11 - Design Proposition # 28	Chapter 8, Chapter 9	10.4.4, 10.4.5
	# 7	The protocol should address both online and offline possibilities, procedures, conditions and tools for co-creation and state where which can be best applied or is most practical	Design Proposition # 10, Design Proposition # 25	9.4	10.4.1-10.4.4, 10.5, 10.7, 10.8
	# 8	The protocol should provide means to assess customers' suitability, i.e. capability to provide useful input when participating in the innovation project.	Design Proposition # 3, Design Proposition # 14	7.2.1	10.4.4
	# 9	The protocol has to provide directions to prepare the participating customer for an optimal participation.	Design Proposition # 5 - Design Proposition # 7, Design Proposition # 14, Design Proposition # 16, Design Proposition # 18 - Design Proposition # 20	7.3.1, 7.3.2, 8.2.4, 8.2.5, 8.4	10.4.4
Operational requirements	# 10	The protocol should provide the user some discretionary freedom in following the prescribed actions.		4.13	10.4.1, 10.4.2
	# 11	The protocol is intended for use by the management of the firm that leads and directs the innovation project.		4.4, 9.5.1	10.4
	# 12	The protocol should provide a basis for repeated and	Design Proposition # 5,	7.3, 9.2	10.4.1

Requirement class	Requirement #	Description of requirement	Compliant with Design Proposition #	Reference theoretical section(s)	Reference protocol section(s)
		continued use.	Design Proposition # 6, Design Proposition # 2		
	# 13	The protocol has to provide guidelines or procedures on how to understand, interpret and translate unarticulated, unconsciously expressed, and intuitive customer input from participating customers	Design Proposition # 3, Design Proposition # 8, Design Proposition # 28	4.4.5, 7.2.1, 9.5.2	10.4.3, 10.4.5,
	# 14	The protocol should provide rules or guidelines for a common language, with which customers' inputs can be communicated with all relevant representatives from the firm, and between customers and innovation team members.	Design Proposition # 28	9.5.2	10.4.4
	# 15	The number and novelty of tools and techniques that are meant to support the customer co-creation should be kept to a minimum.	Design Proposition # 8	4.4.5, 9.4.2	10.4.5
	# 16	The protocol tools and techniques should be directed at supporting the direct and close interaction between NPD team members and participating customers.	Design Proposition # 6, Design Proposition # 27	9.5	10.4.4, 10.8
Boundary conditions		Intention is involvement, not cross selling, deep selling.	Design Proposition # 1	7.2.1, 7.2.3	10.4.2
		Ethical use of contributions			10.4.4
		Respect the customers' privacy and IPR	Design Proposition # 19	8.4.4	10.4.4
		Positive reputation (trust)	Design Proposition # 4, Design Proposition # 6, Design Proposition # 7	7.2.3	10.4.2
		Careful assessment of customers' knowledge	Design Proposition # 3	8.2	10.4.4
		Customers aren't competitors	Design Proposition # 2, Design Proposition # 3	7.2.1	10.4.4
Design restrictions		Organizational change or redesign is not addressed			10.4.4
		Company remains in control			10.4.4
		IPR management is not addressed			10.4.4

**Table 10-2: Compliance of design propositions with design requirements**

## 10.4 Protocol outlines

The protocol is intended for use by practitioners, i.e. managers with responsibility for new product or service development, and consulting experts which support companies in NPD and NSD. Therefore, references to theory are kept to a minimum. If necessary we refer

to literature which is accessible for practitioners – a listing is provided in Appendix X<sup>26</sup>. In addition, the communication style is mainly directive, in particular in the general guidelines (10.4.4) and the route guidelines (10.5 - 10.8), addressing the user with 'you'. Finally, the protocol is also meant to be used, separate from this dissertation, as a stand alone document, in order to achieve that it has to be comprehensive enough for users, without having to fall back to the underlying theory in the previous chapters.

#### **10.4.1 Four main routes in one generic approach**

There are certainly many more ways of engaging customers in innovation. According to Heiskanen et al. (2010) user co-creation is not a panacea for innovation, and that there is no 'one-size-fits-all' method. A highly innovative company will use multiple methods. The important first step is recognizing that customers are, in fact, innovative, and using them in the idea generation process as well as in the validation of existing plans and in the commercialization stage. As we will see the company needs to decide on certain actions in which it has a freedom of choice, i.e. the sourcing of ideas for the innovation, the type and openness of the innovation, the type and amount of participating customers, the timing of the co-creation, and the channel of co-creation. Principally, the decisions can be made separately. A decision on one item can, however, constrain the freedom to decide on other items, e.g. sourcing the innovation through user communities seems to determine that the innovation has to be open and preferably conducted through the online channel, and starting in or limited to the re-innovation stage, which can be deducted from our schematic diagram for the design propositions (Appendix G). With this in mind, we can identify four main approaches, *routes*, in involving the customer in the innovation process:

1. Through the appeal on a user community – existing or yet to be created, preferably online, but with a physical possibility – where existing products, services or platforms are used, reviewed and discussed by customers. The company observes and participates in this discussion through a dialogue, possibly also moderating the community. Opportunities are identified by the company – we will use the metaphor of *dreamcatching*<sup>27</sup> - and translated into innovation projects by the company, in which customers again can participate, see the next approaches.
2. The company can pose users with a specific question or request, a challenge, for which they are expected to think of a solution, of which typically one, or a limited

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<sup>26</sup> This Appendix has been removed after protocol validation; references are now incorporated as footnotes.

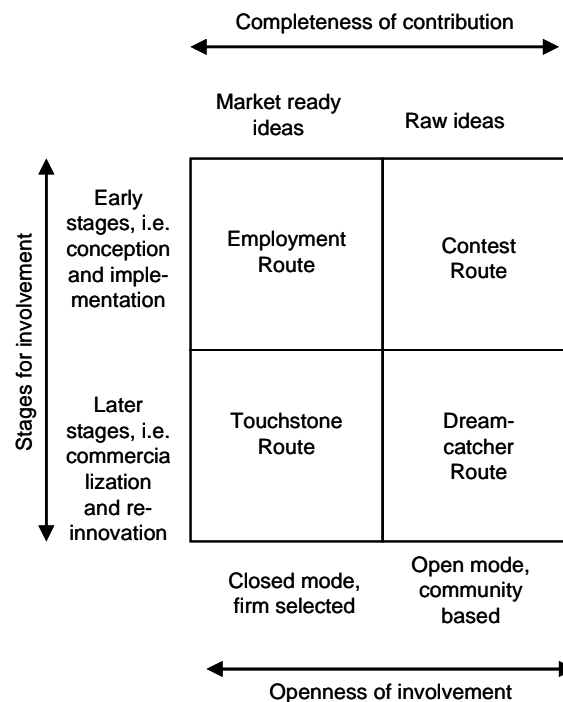
<sup>27</sup> In Ojibwa (Chippewa) culture, a dreamcatcher (or dream catcher; Ojibwe asabikeshiinh, the inanimate form of the word for "spider" or bawaajige nagwaagan meaning "dream snare") is a handmade object based on a willow hoop, on which is woven a loose net or web. The dreamcatcher is then decorated with personal and sacred items such as feathers and beads. It was said that the dreamcatcher "caught any harm that might be in the air as a spider's web catches and holds whatever comes in contact with it." Traditionally, the Ojibwa construct dreamcatchers by tying sinew strands in a web around a small round or tear-shaped frame of willow (in a way roughly similar to their method for making snowshoe webbing). The resulting "dream-catcher", hung above the bed, is used as a charm to protect sleeping children from nightmares. As dreamcatchers are made of willow and sinew, they are not meant to last forever but are intended to dry out and collapse as the child enters the age of wonderment. The Ojibwa believe that a dreamcatcher changes a person's dreams. Only good dreams would be allowed to filter through, bad dreams would stay in the net, disappearing with the light of day." Good dreams would pass through and slide down the feathers to the sleeper (text based on Wikipedia). The term "dreamcatcher" also refers to the story by Stephen King called Dreamcatcher (2001), in which telepathy shows to be a way of communication when infected with an 'alien virus'. The story was filmed in 2003 by Lawrence Kasdan.

amount of solutions are eligible – in metaphor this can be called a *contest*. The intention is to specifically involve the customer in the front end of the innovation, because the company does not know or is not aware yet of customer needs and wants, or the intended product or service requirements. Customer input is then required in the first stage (Conception), but is not necessarily excluded in later stages, where customers can test prototypes and assist in the commercialization and the re-innovation.

3. The company can decide to involve customers in any, arbitrary stage or activity of the innovation process, a sort of a one off. In such a case, the company usually has already identified the opportunities, the innovation project and its goals. Customer co-creation is opportune to verify assumptions, fill in details, and provide additional, not thought of product or service requirements. Of course it is possible to involve customer in more than one activity, but this approach is seen as discrete co-creation activities to support just that particular and specific stage, in which the co-creation is required, usually in the implementation stage and thereafter. The metaphor that can be used for this approach is the customer as a *touchstone*. This approach has been applied in the Client Co-Creation Lab case (see 5.2).
4. The company can, finally, integrate one or more (limited amount of) customers in the innovation project, e.g. by temporarily employing them. We will therefore use the metaphor of customer as an *employee*. This approach is of particular interest in idea generation, design and development activities, i.e. the Conception and Implementation stage, but later stages aren't excluded. We can see this approach applied in customized projects, where it is the intention to create something for a specific set of customers or segment. This can be on request by the customer or because the company has discovered an unfulfilled or unattended set of needs with these customers, e.g. through dreamcatching.

All four approaches show some similarities: customer co-creation in the innovation process can start any stage in the NPD process, in case we assume a generic staging of Conception, Implementation, Marketing and Re-innovation (see 2.7.3). Another similarity is that the co-creation can be restricted to just one activity, a few activities, but can also entail all innovation activities (Design Proposition # 23 and Design Proposition # 22, Design Proposition # 24). Thirdly, as already indicated above, combinations of approaches are possible. But there are also differences. An important distinction between the four routes can be observed when viewing them as extremes on three dimensions, i.e. the 'openness' of the participation, the stages of co-creation, and the 'completeness' of the distribution (see Figure 10-1). Regarding the dimension 'openness' we refer to our elaboration on the 'open mode and closed mode' of participation (see sub-section 7.4.2, Design Proposition # 9, and Design Proposition # 10) where we distinguish on the one side participants that are mainly selected by the company that involves them – it is a 'closed' appeal to participate (the company engages the customer), while, on the other side, in a certain sense, participants select themselves – there is an open call to participate and one is motivated to comply (customers engage and involve themselves). The employment and touchstone routes are therefore typical closed modes of participation, and the dreamcatching and contest routes are open modes of participation. The dimension 'completeness of the contribution' refers to the notion where the contribution can be either focused on obtaining or working on an already defined or almost ready concept, product, or service – which we will refer to as 'market ready' – or on a 'raw and unfinished' idea or concept, which has to be 'polished', tailored and finished to a marketable idea or product. In this respect, the employment and touchstone route are best equipped for the 'market ready' ideas and concepts, while the dreamcatching route and contest route are best deployed for 'raw ideas'. The third dimension, the stages of co-creation distinguishes, at the one side, an involvement in the early stages of the innovation process, that is the conception and implementation stage, and at the other

side, the two later stages in the process, i.e. the commercialization and re-innovation stage. We will argue later on that the employment and contest routes are best suited for the early stages, while the touchstone and dreamcatching routes are deployed best in the commercialization and re-innovation stage.



**Figure 10-1: Distinction between the four routes on three dimensions**

In the next sections we will discuss these four main routes extensively. But, before reviewing them, we will review some points of consideration to determine the most appropriate route(s).

#### **10.4.2 Premises for customer co-creation**

In this protocol we start from a point where the company has decided or is considering initiating an innovation project or program in which customer co-creation might be appropriate. This means that there is an idea about the product or service category for which the innovation has to be reached, and whether the firm wants it to be truly novel – a radical or breakthrough innovation – or just an innovation, which can be either incremental or radical.

We also assume that the firm has some idea about the target market or customers for this innovation. By this we mean that a primary target group has been identified, e.g. senior or junior consumers, financial services companies, governmental agencies, and such. In addition, the firm also has to have an idea about the time frame in which this innovation program has to be executed. Customer co-creation can also be appropriate in a later phase of the project, although we like to emphasize our finding that the sooner the involvement takes place, the better this if for the project result in terms of speed, market acceptance and product quality. Nevertheless, the firm can decide on involving customers in only a later stage of the project. This does not render this protocol as useless. As outlined in our requirements and propositions firms have the freedom to do so. But, in such cases, the starting point will be the project results, outcomes and



continuation plans at that stage. For instance, the firm may have developed a prototype at that stage, and may want to test its fitness for (potential) users. In such a case, we start in the protocol application with a prototype, its intended functionalities, its design or technological limitations, a description of the target customers, a timetable indicating the intended test period and probable launch, and other relevant variables.

We also assume that the preconditions for customer co-creation are or can be met, i.e. the company is market-oriented (Design Proposition # 2) and the market in consideration is suited for firms to involve their customers, that is the market is mature, experience-oriented – instead of product-oriented, the state of technology (Internet) enables interactivity between customers and companies, and customers generally trust the company (see sub-section 7.2.3). Consequently, the company also has to envision the higher outcomes, the so called benefits, of the customer co-creation. As proposed with Design Proposition # 1, a set of benefits can be expected, such as fast adoption, innovation quality, increase of customer loyalty, cost reductions and speed of the innovation. But, not all benefits have to be relevant from the company's perspective, resulting in possible alternative routes.

These assumptions do not imply that it is necessary to have a well defined plan or program description for the intended innovation. However, goals and objectives are necessary to decide on the suitability of customer co-creation and the route to be followed.

#### ***10.4.3 Points of consideration***

If these assumptions are correct, the firm needs to decide whether it is appropriate to involve customers in this particular project or program, and the route to follow. It entails evaluation of and deciding on items like project objectives (what is the innovation about), the timeliness of involving customers (what do we want to achieve by that), the process stages (when to involve the customers), the channels (physically, virtual, both), the participants (who to involve), and control of the process (who decides in the several stage gates), see section 0. According to Cooper (1996) a first important ingredient of quality in the NPD process is the emphasis on up-front homework in the process, both market and technical assessments, before projects move into the development phase. Li and Bernoff (2008) also propose a four step sequential planning to engage with customers in a 'groundswell', the so called POST-process, of which the first three – people: what can you expect from participation; objectives: what do you want to get; strategy: how do you want the relationship to be or change – define such a homework. So we need to think before doing (Wijnen et al., 1995).

As we have seen in our review over the different modes of co-creation, any sector can harness their customers' potential to co-create. In the Open Innovation approach it's now conventional wisdom that virtually no company should innovate on its own (Chesbrough, 2003). Firms nowadays have a myriad of potential partners and ways to collaborate with them, making the choice for the right partners and ways much more difficult. Should firms open up and share their intellectual property with the community? Should they nurture collaborative relationships with a few carefully selected partners? Should they harness the "wisdom of crowds"? There is no best approach to leveraging the power of outsiders. Different modes of collaboration involve different strategic trade-offs. Firms who have already tried have become experienced in choosing the right partners, those who haven't should experiment, but should also take caution. In principle, all innovation projects are suitable for customer co-creation. As the Open Innovation Paradigm depicts, it is recommended to source the innovation partly or completely from outside the organization. However, the firm must make decisions on appropriateness, based on the following related considerations:

- *The impact on customer relations and loyalty.* Having customers contribute in innovations has a positive effect on customer relationship, as is concluded in several studies (Akamavi, 2005; Alam, 2002; Ancarani & Shankar, 2003; Comer & Zirger, 1997; Ennew & Binks, 1996; Friesen, 2001), and proposed in our Design Proposition # 1. Although we assume that firms will always contemplate loyal customers, their innovation activities do not have to be aimed at creating customer loyalty. More important objectives of an innovation can be, for instance, staying ahead of competition in terms of market share, being a first mover, initial penetration of new markets, rendering increase of customer loyalty a minor or less important objective. Also, involving customers as an experiment or a one-off activity will not be aimed at increasing loyalty. In the case that loyalty is of minor importance, the route of the customer as the touchstone can be followed. Thus, the company has to consider, whether customer relations and customer loyalty are important objectives of the innovation project. In such a case, customer co-creation is recommended, and preferably in more than one project. Simply stated, at this stage, the company has to decide on being market oriented or innovation oriented (Berthon et al., 2004). To achieve participation, the firm must expose evidence of long run commitment to its customers, i.e. their willingness to continue the cooperation over time (Etgar, 2008). The routes of dreamcatching or even employment of the customer are routes than can be followed.
- *The preferred 'openness' to the project* (Pisano & Verganti, 2008). In sub-section 7.4.2 we elaborated on the term openness. Openness was simply referred to as the amount of external participants. When a firm uses a closed mode, it is making two implicit assumptions: that it can identify the knowledge domain from which the best solution to its problem will come, and that it can pick the right collaborators in that field. The more specific the innovation is for a customer (customized), the more homogenous and well known the market is, the more comprehensive and finished the idea for the innovation is (concept, prototype, or test ready product), or the more secrecy (IP protection) is required regarding the innovation, the better suited the closed mode of innovating will for the firm (Design Proposition # 9). In the open mode firms may want to source as much ideas or customer input as possible to ensure that the great idea or input is obtained (Design Proposition # 10). Disadvantage of this approach, however, is that the cost of searching for, screening, selecting contributors and contributions grow as the network of participants becomes larger and can become prohibitive. An open approach can also expose the project too much to competitors, increasing project risk and time pressure. Choosing an open or closed approach will have some consequences for other choices to be made, concerning customer co-creation that is that the routes of dreamcatching and contest seem to be the best alternatives for the open mode, while the employment and the touchstone can be best taken – in that order – in the case of a closed mode approach.
- *The stage of the innovation process.* The further the firm is in its innovation process, the less necessary or even appropriate it is to involve customers *for the first time* in the project, because customer involvement could lead to a declination of the reached results, e.g. Huizenga (2001) found that customer involvement in product testing had a negative effect on success. If applied, the touchstone route is preferred over the other routes. Conversely, the earlier we are in the project, the more suitable customer co-creation will be, because this will prevent the firm from developing the wrong specifications, requirements, prototypes and so on. Thus, to increase the success probability of the innovation, the company should aim to involve these customers in an early stage of the innovation process, preferably at the start of the project (Calantone et al., 1995; Cooper & Kleinschmidt, 1986; Gruner & Homburg, 2000; Pitta et al., 1996; Urban & von Hippel, 1988; van Kleef et al., 2005; von Hippel, 1986;1988; Yoon & Lilien, 1988), making the employment or contest route

the best alternatives for co-creation. However, we've seen that starting from the Re-innovation stage can leverage the innovation opportunities. This makes the dreamcatching route the best route available.

- *The preferred 'completeness' of the contribution.* Completeness refers to terms of 'raw ideas', 'market-ready ideas', or 'market-ready products'. Nambisan and Sawhney (2007) have organized the possibilities for the external sourcing of innovations by four variables: (1) the reach that firms have as they cast about for innovative ideas to assess; (2) the cost of acquiring and developing these ideas; (3) the risk involved in trying to turn the ideas in marketable products, and; (4) the speed with which the ideas can be brought to market. Nambisan and Sawhney argue that the more market-ready the idea or product is the firm is looking for, the higher the costs, but shorter the time to market will be. However, the chance (reach) of finding such market-ready offerings is low. In contrast, raw ideas still have to be developed further, increasing project risk and time to market, but reducing costs and difficulty of finding an idea. This approach resembles the distinction in two types of customer involvement put forward by Edvardsson et al. (2006). The first type of customer involvement is aimed at learning more about customers, their stated and latent needs, in order to create an attractive customer value and thus a demand; this type is comparable with Nambisan and Sawhney's raw ideas. The routes of dreamcatching and contest seem to be appropriate for this purpose. The second type is intended to use customers as innovators, using new and pro-active techniques, and where customers are seen as business developers with companies utilizing their expertise; this type is best suited for market ready ideas or products. Our view on this is that market-ready ideas or products can be expected mainly from professionals, inventors, or lead users (Lettl et al., 2006a), while ordinary, untrained or inexperienced users are expected to supply mostly raw ideas, of which manufacturability has not been tested at all (Magnusson, 2009). Firms can best follow the route of customer as an employee or touchstone.
- *The accessibility of knowledge concerning the intended innovation.* As we have seen in section 7.1 knowledge needed from the customer can be difficult to access, reducing the chance for success when involving customers. We therefore proposed to apply tools like the ZMET™<sup>28</sup>, outcome-based research and netnography to access customers' knowledge. These tools can be applied in any of the four proposed main routes for customer co-creation, whereas we observe that:
  - The more professional, technical or industrial the intended use of the innovation is going to be, the more complex knowledge about the use will be. In such a case, we may expect knowledge to also be difficult to access, making customer co-creation less probable, unless customers are knowledgeable – e.g. lead or professional users, thus making the route of employment the best solution. In the case of low tech, consumption products we will assume knowledge to be easier to access, increasing the chance of ordinary users or customers to be involved, therefore making the routes of dreamcatching, contest, and touchstone appropriate ones. However, caution should be taken with this rule of thumb, since research is ambiguous on this matter (Magnusson, 2009).
  - The more novel, radical and disruptive the intended innovation has to be, the less probable it is that knowledge from customers is easy to access, implying that even lead users or professionals cannot provide necessary solutions. The only

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<sup>28</sup> The Zaltman Metaphor Elicitation Technique™ requires specialized, trained and licensed researchers. Not all firms will be able to employ and deploy such techniques, making them dependable on external specialists.

opportunities to involve customers will be by judging or testing ideas, concepts or prototypes which the firm develops that is the customer as a touchstone. Customers' contribution in the front end of the innovation will then be limited to customers submitting their inner thoughts and feelings about certain problems, in order to disclose their latent needs and wants, which can be achieved in the dreamcatching and touchstone routes.

- *The specificity of the problem or question.* The consideration is here whether the firm is looking for solutions to specific questions or trying to discover on its own which solutions or applications exist in the market which it can fit in its innovation (Hansen & Birkinshaw, 2007). The first option requires a more active participation – it is done by firm's request – , and can be directed towards pre-selected participants, which makes the contest route the best alternative. The discovery option requires the search of a wide and diverse range of possible contributors. Looking for a discovery therefore usually results in higher search costs and more development time than requesting a solution to a specific problem. On the other hand, we expect that asking specific questions requires thorough assessments and screenings of potential innovation directions, in which the customer probably will not take part, unless they are about solving problems or acquiring ideas on existing products and services, or prototypes – the so-called re-innovation phase of NPD (Rothwell, 1986). In fact, customer complaints, suggestions, visits, user-to-user interactions in communities, user innovations or modifications may well contain specific solutions that firms are looking for (Sawhney & Prandelli, 2000). To summarize this consideration, we need to wonder whether we have specific questions or problems towards our customers for which we want solutions, or that we just want to see what goes on in the market and discover opportunities we can develop into innovations. In the latter case, dreamcatching should be the route to be followed.

The aforementioned considerations are very interrelated, implying that we cannot decide in a linear manner on when to and when not to choose for customer co-creation. Decisions made at this stage depend highly on aspects like preferred speed (e.g. for firms in highly competitive industries speed can be a crucial), customer base (large or small, heterogeneous or homogeneous), reach (i.e. how many or which of these customers are we able to reach), available budget, and such. We also observe that the considerations aren't a matter of either one option or the other, but that mixed options are also possible, as LEGO proves by observing and involving communities, commercializing user innovations and engaging lead users in projects (Antorini & Schultz, 2007; Seybold, 2006). We also do not exclude the possibility for firms to create a mix of external sources in which many other firms, like suppliers, or research institutes participate (Tapscott & Williams, 2007), confusing simple decision making on the matter. It is important also to denote that many decisions to be made in this step are also highly dependent on organizational characteristics and the experience that the company itself already has with involving customers or other external parties in innovations or any other organizational process (Hansen & Birkinshaw, 2007; Koufteros et al., 2005; Nambisan & Sawhney, 2007). Otherwise, the organization will expose some barriers that can be detrimental to customer co-creation. Firms should find their own approach in deciding, but we would like to propose to review all these considerations in a facilitated workshop for all concerned in this decision making. The combination of criteria – the innovation project phase, the impact on customer relations and loyalty, the intended openness, the preferred completeness of ideas, the accessibility of knowledge, and the specificity of the problem –, should lead to a discussion, followed by some kind of consensus on whether or not to involve customers, the route to involve them, and expected contributions, by the participants.

## Specific aspects

In industrial and B2B settings, the decision to involve the customer may be made much quicker and easier than in consumer settings, because many B2B companies are already accustomed to this phenomenon, especially those companies that apply an engineer-to-order business model, in which customer co-creation is something like a prerequisite. In addition, B2B-companies usually have more knowledge about the identity and whereabouts of their (lead) customers than B2C-firms have. We therefore expect the route of customer as an employee to be followed more by B2B than by B2C companies, while the contest route (crowdsourcing) typically can be found in B2C over B2B firms. However, we emphasize that this protocol entails more specifics than what is commonly known and used in B2B on customer co-creation. For instance, customers in B2B-sense do not necessarily have to be the same as end users, meaning that, e.g. participation of procurement representatives in project progress meetings, is not what this protocol intends to achieve. Therefore, even B2B-firms have to review the aforementioned considerations in the context of *end user co-creation*.

Companies which have already done innovation projects with customer co-creation incline to skip this step. However, it is advised that such companies should evaluate this strategy on the basis of these outlines, especially when these previous projects concerned the involvement of other users than the end user (see above).

## Execution

The preferred way to make this decision is a 3 – 3,5 hrs workshop, preferably prepared and facilitated by an experienced facilitator, presenting and discussing options, best practices and guiding decision taking on the several choices. To prepare for this workshop the facilitator will execute an intake interview with the manager(s), responsible for innovation projects. This intake is attached as **Fout! Verwijzingsbron niet gevonden.** appendix to the 3CI-Protocol version 1.0. Its objective is to summarize the context (market, products, customer segments, etc.) and intention (innovation goals) of this specific firm.

The participants for this workshop should be project team members, innovation experts, and product developers of the company, which will be involved in this particular innovation project. As has been elaborated on in our theoretical and practical evaluation of customer co-creation, it implies that these people will be exposed to the customer interaction. In order to manage time and agenda it is advisable to have at least four (4) and at most seven (7) participants.

Preceding the workshop about the suitability check it is advisable to have the participants do a simple test, a so called *Quick Scan*, to support the decision on whether it is appropriate to engage with customers for an innovation. This Quick Scan is also attached as an appendix to the 3CI-Protocol .

A recommended (dependant on participants' prior knowledge) program for this workshop would be (see also the 3CI-Protocol version 1.0):

1. Introduction and goals of the workshop
2. Benefits and disadvantages of customer co-creation in innovations
3. Based on general theory and practice on co-creation, deciding on:
  - a. Participants' requirements
  - b. Phases / periods for co-creation and the expected outcomes
  - c. Channels suited for this co-creation
  - d. Incentives to motivate and reward participation
  - e. Special tools and techniques:

- i. Which tools does the firm usually apply and are they suitable to involve customers
  - ii. Which particular exceptions should be made for this usually applied set of tools
4. Deciding on the route for customer co-creation: points of consideration
5. Which persons or functions of the firm are going to participate, i.e. are exposed to the participating customers, conduct communication with customers, etc.
6. Closure of the workshop by setting out the actions customer co-creation (making the plan).

Most SME's do not have large innovation project teams with which we can reach the ideal amount of participants in the workshop. In most cases there will be only one manager responsible for innovations, many times the entrepreneur himself. In such cases it is better to replace the workshop with a strategic sourcing interview, where the workshop program, intake form and quick scan are used as a basis.

Summarized, the options are as follows:

Consideration points for 3CI-decision	Options	Recommended route(s) (in order of suitability)	Remarks
Stage of co-creation	Early (in FFE)	Contest Employment	Crowdsourcing (large group) Restrict to only one or a few customers (B2B)
	Late Implementation, Commercialization (in)	Touchstone	Concept, prototype, beta testing Marketing tests Product trial
Expected benefits (on loyalty and CRM)	Improve customer relations	Dreamcatching Employment	Use customer community When innovation is customer specific
	Other company-driven outcomes	Touchstone	
Preferred openness of 3CI	(Totally) open mode	Contest Dreamcatching	Crowdsourcing (B2C)
	Closed mode	Employment Touchstone	Customer specific project Market-ready ideas and concepts
Completeness of contribution	Raw ideas	Dreamcatching Contest	
	Market-ready ideas and concepts	Employment Touchstone	
Knowledge accessibility	Difficult	Employment Touchstone	(High) technology based Radical innovations
	Easy	Dreamcatching	Low or no technology Incremental innovations
Problem specificity	Company specific	Contest	Specify problem and challenge customers
	Market specific	Dreamcatching	Monitor complaints and user solutions in communities

**Table 10-3: Choosing the best route for co-creation**

In Figure 10-2 we visualize the 4 probable routes in relation to the design propositions (1-28), the elaboration and the decisions that have to be made to decide on the appropriate route. From this figure we can see that some propositions apply several of the, or even all, four routes, while some apply to only one route. This may look counterintuitive, but we want to emphasize at this point that the figure depicts the *most optimal* flow of decisions and actions, thereby not excluding alternatives.

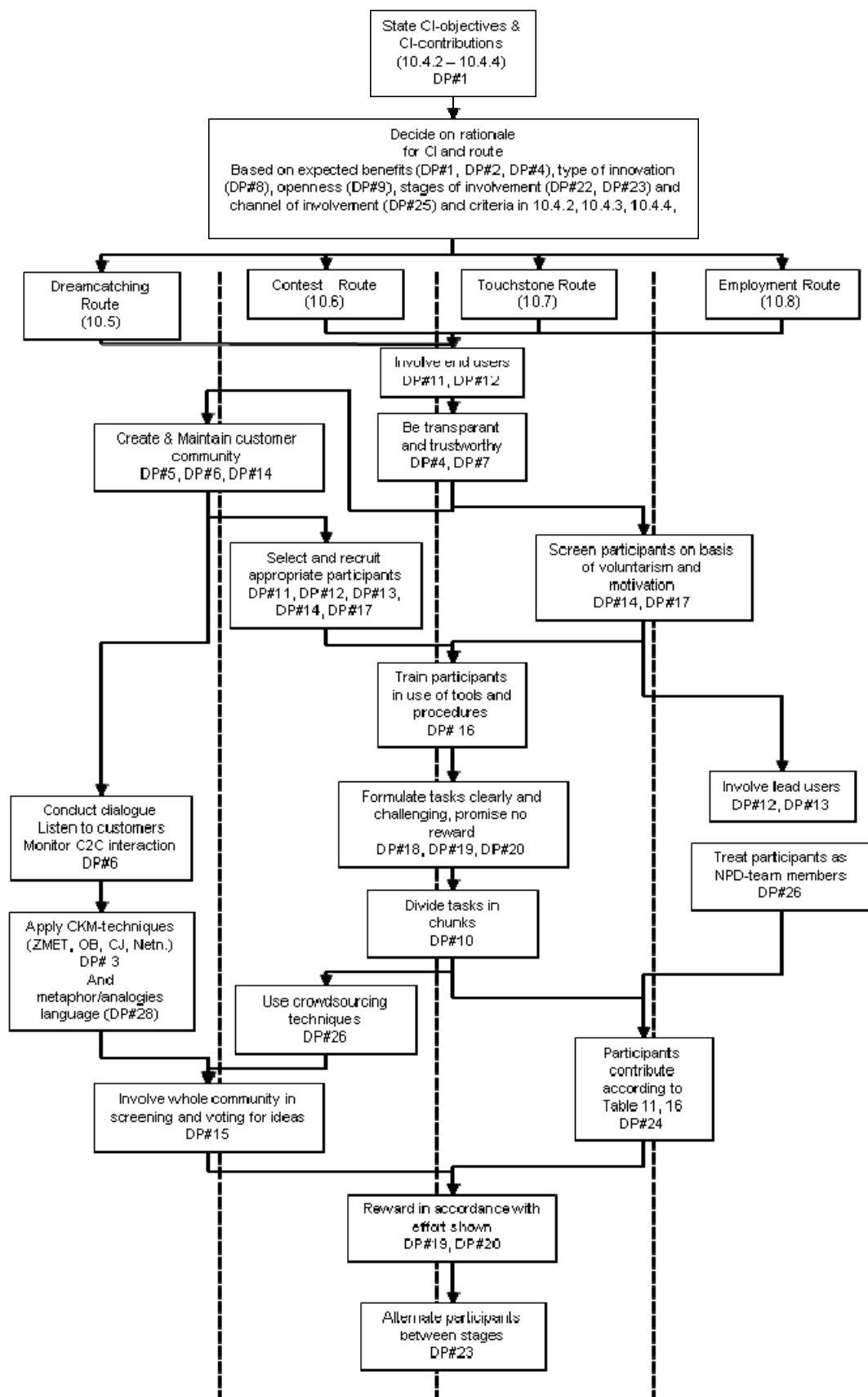


Figure 10-2: The four alternative routes with applicable design propositions

#### ***10.4.4 General guidelines for all routes***

##### **Strategic objectives and rationales of customer co-creation**

Before initiating a customer co-creation project, it is important to state the strategic objectives of the endeavor. Based on the objectives of the new product and service development project or program and available resources, decisions should be made in terms of what the customer should contribute. The stated objectives in terms of customer contributions will influence the rest of the project in terms of the customers who are selected for the task, how much and when they are involved, and by what means. The rationales for co-creation are depicted in Design Proposition # 1.

##### **Problem definition and formulation**

The most important activity in this step consists of formulating the proper tasks, challenges or questions towards customers. These should be easy to understand, but do not have to be uncomplicated (McKeen et al., 1994). When the task is too difficult to understand, customers might not be motivated to participate or lose interest during participation. However, if the task is not too simple and the product or service to be developed is also complex, customers might consider it a challenge and be more motivated to participate. Parkinson (Parkinson, 1985) for instance, has observed that the extent of user involvement during NPD was far greater for customized products than for standardized products. Problem recognition and understanding is a critical first step in all problem-solving procedures. A problem not understood cannot be solved. The problem should be stated as precisely and concisely as possible, consistent with its real-world complexity (Design Proposition # 18). The problem statement should be constructed in terms of the capabilities or outcomes sought, not in terms of desired technology (Ulwick, 2005), the so-called outcome-based approach. It is difficult but necessary to think of a "land-based people mover," not a "car" or "bus," or of a "container for the foot," not a "shoe."

If the problem is large or complex, it may be advantageous to break it down into sub-problems that can be attacked and handled separately (Design Proposition # 10). To make it possible for many contributors to participate effectively in a co-creation community, problems should be broken down to let contributors work in parallel on different pieces. Otherwise, it will be impossible for a critical mass of participants to co-create effectively (Bughin et al., 2008). The results may then be combined to secure the overall solution. A global team of more than 2,000 scientists, for example, participated in the design of the ATLAS particle detector, a complex scientific instrument that will be used to detect and measure subatomic particles in high-energy physics. The effort was disaggregated into many different components and distributed across 165 working groups, which used Internet-based tools to help coordinate the work. But it is well to remember that this procedure can result in sub-optimization.

Procedural devices are sometimes helpful in achieving good problem statements. Be concise, but do not arbitrarily limit the length of the statement. It is often useful to require the problem to be restated some minimum number of times, say, four or five. In addition to obtaining a suitable statement of the problem, these reworking techniques also help to familiarize the problem solvers with the various aspects of the problem and its environment. They may even aid in establishing the validity and significance of the problem.

##### **Aim for end user co-creation**

This protocol has been developed to involve the (potential) end users of your product or service (Design Proposition # 11). End-users often think in terms of making their existing work better, rather than in terms of finding completely new ways of working. For this



reason, end-users should be involved. Therefore, aim for their participation, not from any one else. Not those other customers aren't able to help you to develop a new product or service. In this case, however, we aim to involve end users who know what to do with and expect from the product – involving them enhances the chance of developing something that is really needed. In industrial contexts, a firm's procurer must have different requirements when buying a new product, say for example a printer, than the users of that printer, i.e. employees from the different departments. The procurer will look aside from some fixed technical requirements like weight, printing speed, etc., at costs, standardization, delivering time, service deals, and such; the end user may be more interested in user friendliness, reliability, amount of paper in one load, and such things. But keep in mind, in this printer example the procurer might also be an end user. This could be different for other products and services. For consumer situations, there may also be a difference between the buying, the deciding, the selecting and the end user customer. For example, a family pays for its groceries, but the mother may be deciding and selecting on the brand and type of the breakfast cereals for the five year old kid who is the end user. And again, the father might also want to indulge for the cereal in the morning, transforming him into an end user as well.

One should also be aware of the fact that the same product or service may have a diversity of end users. This is particularly the case with composed or complex systems. For instance, an aircraft may distinguish different end users: the pilot when it comes to the flight characteristics, the cabin crew when it comes to its suitability to service the passengers, the maintenance crew in the case of its maintainability, the loading crew when it comes to its storage space and loading ease, and not to forget the passenger that uses the outcomes of the mentioned users.

To widen your perspective, involve real customers. The best approach depends on your market. The company should not replace customers with employees or other experts, representing or playing the role of the customer – as is the case in use experience software development, unless they are also customers, see for example Kotro (Kotro, 2007). One may not be able to recruit real customers to act as the participating customers because of their anonymity, distance or other reasons. Still, the company should try to reach its real customers. One way to recruit real customers is to move the NPD-team to the customer's offices rather than asking them to join you at yours.

One danger of involving real customers is that they won't necessarily reflect the needs of all your customers. Be careful that they don't steer you towards creating products or services that's only useful for them. Your project should remain based on a compelling vision. Customer desires inform the vision and may even change it, but ultimately the product manager holds final responsibility for product direction. To avoid the strong influence of just one customer, we propose to alternate participants throughout the project (Design Proposition # 23). Another option, reportedly used by Amazon, is to deploy changes to a small percentage of visitors and observe how their usage patterns change.

### **Determining which and how many customers to involve**

We have shown that theory is very ambiguous concerning the type of users or consumers to involve. Initial research indicates that not every customer is capable of contributing in the innovation process. Von Hippel suggests that companies should aim on lead users (von Hippel, 2005), meaning that these users are usually professionals in the field of work of the product or service being innovated. Other research, however, indicates that ordinary, less experienced users, can generate more original or better ideas than professional users (Kristensson et al., 2004). Later research (Magnusson et al., 2007) has even proven that, if trained in advance on process skills, ordinary users can complete innovation tasks better than professional designers. We translated this finding in Design

Proposition # 16. Gruner and Homburg (2000) found that for the best result in NPD, the characteristics of customers in order of the best to the least success should be: lead users, financially attractive customers (potential market), close customers (relations) and technical attractive customers, whereas the last group led to almost no success at all. We have depicted these findings in Design Proposition # 11 and Design Proposition # 12, which tell us that in general it does not matter whether we appeal on customers or potential customers, as long as they are familiar with the product or product class (by being a user or ex-user).

The different phases of the innovation process require different skills and knowledge from the participants in the several phases, implicating that one can not engage the same customers throughout the complete innovation process, because of these changing skill needs. The traditional model of NPD and later generations illustrate and emphasize the importance of customers in several phases of the innovation process (Holt, 1988; Nambisan, 2002; Sawhney & Prandelli, 2000), but neglect to state whether this should be the same customers for all stages. Customers can fulfill different roles in the innovation process (Nambisan, 2002; Zeithaml & Bitner, 2003) making it more difficult to find all these roles in one single person. We therefore propose to alternate participants along the process (Design Proposition # 23).

Our own practice (Brabant-Zeeuwse Werkgeversvereniging, 2004; Weber, 2008a) and numerous cases, like LEGO, Fiat, Kraft, IBM, show that requirements regarding knowledge, expertise, technical skills, and such do not matter. As long as participants are a qualitative representation of a company's customer base, i.e. familiar with company, its products, and use of its products or services, co-creation may always pay off. And obviously, it is can be expected that people who are expressive and socially communicative will provide better input for the process, but we believe that – because it is difficult to find such people – companies can better start with this representation of their customers, and build up experience in recognizing these qualities among them (Davenport et al., 2001). People to whom it is clear what is expected from them, who feel they can contribute or have contributed previously, and are enthusiastic about that, will contribute, whether professionals, the creative class, amateurs or pro-ams (Florida, 2002; Gershung, 2002; Leadbeater & Miller, 2004; Li & Bernoff, 2008). And the more a firm can engage in participation, the greater the chance that someone or the crowd as a whole will deliver the solution or great idea you are looking for. There is no maximum number of participants, however, in order to get reliable and valuable input, firms should keep a minimum amount of 15 participants in mind (Design Proposition # 17) – unless your customer base is smaller or the innovation in question is a customized one.

In case of online co-creation with participants residing in online communities, we have developed Design Proposition # 6 and Design Proposition # 26 , entailing:

- To gather information about users, usage, product adoption, and product shortcomings or complaints, firms should make use of (existing) user communities – called *virtual customer communities* by Chan and Lee. These communities consist of all kind of users of a product (category) that interact with each other, discussing positive and negative features and experiences. Their contribution is mainly of interest in the marketing and re-innovation phase, and participants do not necessarily have to be recruited for co-creation, even though it would be polite of the firm to at least inform them of their involvement.
- However, for all other stages and activities, like e.g. needs assessment, idea generation, concept and product testing, firms can 'recruit' certain users from these customer communities, and create – when a large group is recruited or invited to participate – a so called *innovation community* – named *user content collaboration*

*innovation community* by Chan and Lee - in which they perform tasks or make contributions on invitation by the firm.

- To test products, concepts and prototypes of complex or technological advanced and novel products, firms should preferably involve *lead users* or advanced users that they employ in so called *beta testing volunteer corps*.
- To participate in design and development activities, firms should invite *motivated* and *capable* users from the customer community, and have them form a *user development community*. To establish these features – motivated and capable – firms should have the invitees undergo an intake interview (Design Proposition # 14), as is done with recruitment of new employees. These users may be *lead users* or advanced users, but this is not a requirement. However, one may expect advanced users to perform more complex design or development tasks than ordinary users.

### Recruiting participants

To recruit participants, all media or communication channels can be used, website call, emails, newspapers, radio, television, invitations in social networks depending on the amount of disclosure the company wishes to emphasize. Regardless of this media, the firm should take account of the previous guideline on problem formulation, and make it clear in advance to all prospects what is expected from them: the objectives, required skills, intake procedure, specific training, and such.

The search process for suitable users is in itself a creative process that has to be tailored to the specific demands of the search field in question (Design Proposition # 13). Two basic processes can be described here (Herstatt, 2002):

1. Screening Approach: With a large number of product users a "search pattern" can be used to test the existence of already determined characteristics. As well as that information on hand within the companies from customer data banks, complaints lists or external audit information can also be used here from customer surveys done over the telephone. This process is suitable when the number of customers in the market is manageable and therefore a more or less complete screening of all users is possible. This approach is in particular suitable to collect ideas from representative and extreme users.
2. Networking Approach: In this case, only a few customers are included at the beginning and are questioned as to whether they're aware of other product users that have new needs or are currently actively innovative. These kinds of recommendations usually lead very quickly to particularly interesting users. A great advantage of this method lies in the fact that the team often will refer analogous fields in which similar challenges are to be found as those in the actual search field. An example of this is a medical imaging innovation project with the aim of diagnosing very small tumors. During the search process, not only were leading radiologists involved but also experts from the military consulted as Lead Users. In order to identify small forms (e.g. weapons) on satellite images, pattern recognition software is often utilized in the military, where even with bad resolution excellent results are achievable. This application of a pattern recognition system was completely new for medical imaging because until then in-creasing the resolution was the primary goal of research. The networking approach is particularly suitable for the identification of extreme and analogous users.

Depending on your relationship with your customers in B2B situations, you may be able to ask your customers to 'donate' real end-users to participate.

## **Innovation benefits from communities**

In some ways, the output of all communities is co-innovation of one kind or another (Design Proposition # 5). Either customers are contributing ideas about products or they are offering opinions about branding, advertising and similar subjects (Beagle Research Group, 2006). There are also undoubtedly many advantages of the involvement of online communities over, e.g. traditional focus groups. Whilst there are undoubtedly some benefits of using an experienced facilitator in a focus group, there are sometimes problems such as: the facilitator who knows the answer and is hell bent to get there; the questions that are never asked or sought due to over-scripting; the conclusion that is confected because we have a deadline; the attendee who answers as they believe they should not as they would; and the group pressure that gets in the way of individual 'truths'. Some of these factors are of course still present in an online environment but there are arguably some naturally occurring benefits. Artificial deadlines are not as relevant for an 'always on' community. Ideas that the company or the facilitator hadn't thought of will float to the surface if they are important and popular. Ideas are more likely to be judged on their merit than by the lesser known personality or social standing of the contributors. The larger numbers involved make for broader based sampling. And finally, the speed of execution in an online community – a company will generally have the comprehensive 'position' of a community within 24-48 hrs of asking a question – is very attractive for many purposes. For most companies customers are likely to already talk about them in (online) communities. The company can leverage these conversations to gain new insights into its products and find new sources of revenue.

A customer review board may not be a good option for involving communities. Instead, find other ways to involve customers: focus groups, user experience testing, community previews, beta releases, and so forth.

## **Online co-creation (crowdsourcing)**

In case of an online co-creation (Design Proposition # 25), the company should consider the creation of a customer community (Kim, 2000; Lynn et al., 1997) and the development of an online toolkit if it intends to have the customer participate more often than this occasion (see Appendix F), see Design Proposition # 4 and Design Proposition # 5. In case of the online co-creation, special attention must also be given by the firm to community management, i.e. training managers and employees for this task.

To build a community we refer to appropriate literature, such as Kim, 2000, and our Design Proposition # 6, stating the design principles that have to be taken into account. If the community already exists, measures have to be taken in order to make community contributions and interaction possible (toolkit). If it is not the company's intention to involve its customers more frequently, it should consider a broker or mediator to facilitate this interaction (Sawhney et al., 2003), preferably in combination with the direct engagement (Verona et al., 2006). Companies may also consider appealing on social networks, such as MySpace, Facebook, LinkedIn, but have to keep in mind that that this requires consent and support from the network staff, entails a large exposure and may attract others than intended (the target group). In any case, the company should deploy crowdsourcing preparations, i.e. either crowdcasting or crowdstorming methods (Design Proposition # 26). In the online case it is especially important to make the challenge easy and uncomplicated, but nonetheless challenging (Design Proposition # 18); the firm should also consider to make relevant information, like data and already performed research, available to participants (Geerts, 2009). The broker or mediator can assist on this particular aspect.

To select the participants, community members or staff can be approached with the question which particular members are regarded as suited to make contributions (Design Proposition # 13). An alternative could be to write out a contest or even virtual stock

markets (VSM)<sup>29</sup> (Spann et al., 2009; Spann & Skiera, 2003) to identify qualified community members (Füller et al., 2006) or lead users, through the mechanism of self-selection (Spann et al., 2009). Drawbacks of the selection of lead users through VSMs, however, is that lead users do not all perform well in buying and selling virtual stocks, and that it may attract customers with a tendency toward gambling.

When the initiative has to be integrated in the company's own website, it can be adapted to the choices that are made. There are several companies that are specialized in wikis, forums or social networking that could be useful when interaction is desirable. However, in many crowdcasting cases, a simple upload possibility is sufficient, which would not require much effort. In the case of crowdstorming, however, website design will pose an important challenge in the preparations. Füller et al. (2006) provide several criteria to be considered when designing the interaction tool, but state that there is no single best solution for this design, since it also depends on the context, i.e. the purpose and sort of contribution. In any case, this design can also be outsourced to a special organization. Hunt (Hunt, 2009) also provides many practical tips on the use of technology tools and applications to reach online communities.

But not all community-building efforts should be online. Once the company has begun to identify and collect information about its customers, it may consider creating offline meetings for them. For example, if the company creates an online community for its customers, and discover that 100 of them live in Amsterdam, it could work with these customers to set up an offline meeting in the Amsterdam area. This would also be an ideal opportunity for representatives of the company to spend quality face-to-face time with its customers, which is an efficient way to collect valuable feedback.

## **Dialogue language**

Participants can have diverse cultural and professional backgrounds that can impede a proper understanding by the company. In understanding the customers, especially when it comes to articulating what they need or want. It seems counterintuitive to suggest that customers can't tell how they think or feel. We assume that the motivations for our behavior – whether buying a car, applying for a mortgage or joining a community – are already available to us, waiting to be articulated. But a great deal of multi-disciplinary research – in psychology, cognition, neuroscience, linguistics, and anthropology – is suggesting otherwise, e.g. Zaltman (Zaltman, 2003), Dijksterhuis (Dijksterhuis, 2007), Gladwell (Gladwell, 2005), and Ariely (Ariely, 2009) , stating that most of our thought, emotion, and learning occur in the unconscious mind – that is, without our awareness. Because language plays such a prominent role in our lives, we tend to believe it is synonymous with thinking, but in reality, our thoughts precede words, and not vice versa. That thought often takes the form of images or metaphors (Zaltman, 2003). Because metaphors extend the boundaries of literal language, they can reveal hidden meanings, needs and wants, or thoughts that might otherwise be overlooked. Metaphors also appear to have neurological foundation, and often reflect our embodied experience (Gibbs et al., 2004).

We believe therefore that, instead of focusing on linguistic aspects, the firm should mind the metaphors and analogies used in the dialogue with their customers. Without further discussion or arguments we thus propose that companies should use their customary tools and techniques as much as possible, but take into account that interaction with the customer is conducted through the (basic) techniques like metaphor and analogy

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<sup>29</sup> A virtual stock market (VSM) consists of bringing participants, preferably experts, together via the Internet and allowing them to trade shares of virtual stocks (Spann & Skiera, 2003).

reasoning, and in-depth customer interviews (Design Proposition # 3, Design Proposition # 28).

### **Plan for the unexpected**

When participants feel that their in control and are able to influence the outcomes of the company (Design Proposition # 4, Design Proposition # 5, Design Proposition # 7, Design Proposition # 27) they may tend to exercise that power and act or behave in an unexpected manner, such as criticizing the company's openness, honesty or initiative. Similarly, content contributions can also take unexpected directions, e.g. customers may question the dominant features or needs identified by the company, and suggest other features and needs they deem more important. Projects are each unique, compared to standard operational activities, so they tend to have even a higher uncertainty (Pollack-Johnson, 1995). Whatever the situation, key take away of these possibilities is that the company shouldn't plan the innovation project in too much or great details (Heath & Heath, 2007). Anticipate for chaos, and learn how to deal with the situation, and do not be inhibited to have participants take (part of) the control over the process (Hunt, 2009).

### **Training of participants**

If specific tools are to be applied, participants should get training or an introduction in using the particular tool (Design Proposition # 6, Design Proposition # 16). As long as the designated tools for innovation are easy to learn by the customers, training or introduction probably won't pose any problem. However, when resorting to more difficult and complex tools, companies must be aware that training should get adequate attention. To assess the training intensity and participants' skills, participating customers should undergo an intake before being tasked for involvement (Pitta & Franzak, 1996). This intake is an in-depth interview (long interview) to chart out participants' mental models and current knowledge, for instance via the ZMET™-methodology (Design Proposition # 3). Based on the common mental map, training (or introduction) in the use of the particular tool is designed and administered. But, the interview results can also be used to create an initial set of metaphors or analogies that define the problem the participants are going to solve (Design Proposition # 28).

To avoid a decreasing motivation as time goes on and the effect that people get carried away with their own ideas, thereby blocking new ideas, Design Proposition # 23 was developed, entailing that we try to change participants in each stage. This will imply extra effort to accustom and eventually train these new participants each time, but on the other hand it ensures new and different ideas and insights throughout the whole process, and also creates diversity in participants, increasing the chance for success.

As a form of rewarding participants for their contributions (Design Proposition # 20, Design Proposition # 19), companies can choose to appoint them as mentors or trainers for future, new participants, similar to the process of creating seniors and leaders in online communities (Kim, 2000). The advantage of this choice to involve participants as trainers is that they perceive this nomination as recognition for their contribution. It also increases acceptance of the training by novice participants, since the trainer is perceived as a peer.

### **Treat participants as your employees**

When you work co-creatively you are really interacting in a constructive way with your audience. Rather than merely listening to their opinions, in the classic 'stimulus/response' model that dominates the market research industry, mediated by a third party while you keep your distance behind the anonymity of the viewing facility mirror or the quantitative survey, in co-creation sessions members of your target audience are 'seated beside you',

contributing ideas, translating business language into everyday words, helping to evolve concepts into more lifelike entities (Design Proposition # 27).

If you can't bring real customers on to the team, make an extra effort to involve them. Meet in person with your real customers for the first week or two of the project so you can discuss the project vision and initial release plan. If you're located near each other, meet again for each iteration demo, retrospective, and planning session. If you're far enough apart that regular visits aren't feasible, stay in touch with instant messaging and phone conferences. Try to meet face-to-face at least once per month to discuss plans. If you are so far apart that monthly meetings aren't feasible, meet at least once per concept or prototype version.

Rather than involving real customers as members of the team, create opportunities to solicit their feedback. Some companies create a customer review board filled with their most important customers. They share their plans, ideas and concepts with these customers and—on a rotating basis—provide prototypes or beta-versions for customers to try.

### **Rewarding participation**

Customers like to be recognized for their accomplishments. While contests with monetary prizes are certainly one way of providing such recognition, often the most motivating form is praise from peers and recognition by the company. LEGO Group understands this well and provides forums for customers to submit their designs and vote on the designs of others. Research shows that many users that participate in co-creation do this mainly for intrinsic reasons (self efficacy, recognition) than for monetary rewards (Füller & Bartl, 2007; Jeppesen & Frederiksen, 2004). One of the interesting perspectives is provided from the viewpoint of OSS (open source software) communities where people are working in a voluntary basis without receiving direct compensation. Although some of the participants are getting their salaries from the companies, the basic idea of OSS has been traditionally based on free work and still often is. But, contrary to experimental findings on the negative impact of extrinsic rewards on intrinsic motivations (Deci et al., 1999), it was found that being paid and feeling creative on F/OSS projects does not have a significant negative impact on project effort (Antikainen & Väättäjä, 2008). In the light of the rewarding models used in successful open innovation intermediaries, like InnoCentive, it seems reasonable to assume that multiple and varying types of motivations are present and members may also have multiple simultaneous goals behind their participation. If this is true, a combination of both monetary and non-monetary rewards would be optimal for members (Design Proposition # 19, Design Proposition # 20). Examples of rewards or incentives are approval, paychecks, trophies, money, praise, attention, grades, scholarships, prizes, food, awards, honor-roll lists, public recognition and privileges. Some practical 'rewards' are suggested by Hunt (2009).

Particularly in the case of B2B customer co-creation, appreciate and also respect the contribution of participants with confidentiality (Lewis, 1995). Participating customers are not inclined to communicate their ideas, problems and solutions to the requesting company, unless they can trust the company to not disclose this information to the participants' competitors or other stakeholders. Communicate this measure in advance, and if needed, do this in writing. Also make arrangements about IP ownership in advance, in order to prevent later discussions and conflicts about IPR.

### **Evaluation**

It is recommended to evaluate all activities and outcomes in order to adapt the following activities or next project. This is an activity that continuously takes place, making the protocol process, as has been stated earlier, iterative. Participating customers should be included in these evaluations, since their perceptions and view on process and outcomes

have great influence on future participation, not merely their participation, but others' as well. It will also increase trust and loyalty for the company (Hunt, 2009).

It is also suggested to debrief participants on their experiences and willingness to participate again, especially when it was their first time (Füller et al., 2006).

### Boundary conditions

Another important aspect in the preparation for customer co-creation is process of removing or reducing organizational and political barriers and implementing the enablers, like creating capacity, making resources available, train employees, assigning a project manager, a moderator for group sessions, and such. The company should also create a mechanism for co-creation, i.e. to take care of clarity and transparency regarding rules, leadership, and processes, both internal as external to the company (Bughin et al., 2008), see also Design Proposition # 7. One must also consider logistic measures as the recording of meetings, taking meeting notes, reporting progress and results, and such. Finally, it is important to clearly agree with participants on dates, times and duration for interaction, meetings etc.

### 10.4.5 Process stage aspects for all routes

All phases or stages that are suited for co-creation with customers as long as the interaction between firm and customers is intensive (Callahan & Lasry, 2004; Parkinson, 1982; Voss, 1985). We have depicted this in Design Proposition # 22. The sooner the customer is involved and the more stages the customer participates in, the better this is for the innovation success (Design Proposition # 21, Design Proposition # 22). In other words, the sooner and the longer the customer involvement, the better this is. However, organizations should remember that customer involvement should take place throughout the innovation process, not just in the early phases during what we call the 'front-end' of innovation. Too often, companies fall into this trap. Once they have gotten input from external sources such as the community during the front-end of innovation, they do everything themselves. Granted, it is a good thing to get a more diverse input early on, but why miss out on the full potential of open innovation when you more or less shut down for external resources later in the process. In Table 10-4 we summarize the distinct stages in the NPD and NSD along with the activities in which customers can be involved (see also Design Proposition # 24).

Innovation stage/phase	Activities and customer contribution	Customer requirements	Rationale	Tools, techniques, methods
Conception	Giving opinion on Strategic Planning and Requirements Analysis	Restricted to B2B: close customers, lead users	(Lead) users are familiar with needs and are prone to judge solutions correctly. Secrecy/closure is required.	Delphi panel through scenarios Have customers give feedback on plans and potential markets
	Latent needs articulation and specification; Input (needs) for <i>radical innovations</i>	All customers  Additional lead users	People are unable to articulate unknown or latent needs, unless they use analogies, metaphors. Elicitation and interpretation techniques are needed for this.	Special techniques like metaphor- and outcome-based communication (interviews), customer journey and netnography
	Idea generation	All customers	Customers are motivated and creative when personal benefits and challenging contributions are perceived. Customers can find	Traditional and modern idea generation techniques. Virtual or on-line focus groups Look for metaphors



Innovation stage/phase	Activities and customer contribution	Customer requirements	Rationale	Tools, techniques, methods
			solutions for their own problems, criticize existing products and services, and provide a wish list.	and analogies. Improve creativity by envisioning personal benefits, stating clear objectives and tasking with challenging tasks. Train participants in techniques
	Idea screening	All users	Peer review motivates to deliver quality. Not an in-depth selection, but a selection of a large list of ideas: customers can suggest benefits, liking, purchase intent on basis of ideas	Involve other customers (community members) to screen ideas from participants.
	For radical innovation	Lead users		Have community point out its lead users
Concept development	Defining requirements	All users	Customers are able to evaluate requirements in the context of their use problems.	Use outcome-based approach to define requirements. Alternative tools: Consumer Idealized Design Have customer review requirements. Provide prototype or concept for evaluation
	Design	All well-motivated users	Co-designing, where customers modify, change, improve or complete the company's initial design is very common.	Have customer design his own product or service by providing design tools Train in the use of tools
Concept testing	Concept test Prototype testing	All customers	Customers are capable of identifying successful and unsuccessful concepts, provide likelihood to buy, and give feedback on performance Trying out a prototype in use context provides valuable insights on potential success of new products and services.	Concept testing Prototype testing Service testing Beta testing Usability tests
Commercialization	Market plan development	All customers		Use online (brand) communities Customer-branding
	Advertising (tests)	All customers	Brand commitment and advocacy can lead vigilante marketing	Have customers make own commercials on e.g. YouTube Commenting on advertisement concepts
	Innovation diffusion	All customers Lead users for	Customers can influence other	Testimonials, recommendations

Innovation stage/phase	Activities and customer contribution	Customer requirements	Rationale	Tools, techniques, methods
		radical innovations	potential users through word of mouth Customer involved creations are easier adopted than company creations.	Act as launching customer Sampling
Use	Improvement suggestion Complaints Modding, hacking Supporting other users	All customers	During use customers encounter shortcomings in product or service features. Some develop their own solutions, but many complain, either formally or through word of mouth	Monitoring user communities Allow modding and hacking (to some extent) Provide base products for experiments

**Table 10-4: Protocol – Phases, customer requirements, contributions, tools and techniques for co-creation**

## Conception Stage

### *Requirements Analysis/Strategic Planning*

This activity is best supported by customers through the activity of needs assessment, where the idea is to seek for needs that are not yet fulfilled. Many tools have been developed for this activity (Holt et al., 1984), like user observation, focus group interviews, diary-reporting, customer in-depth interviews, etc. We refer to the literature for the specifics of all these tools, and constrain ourselves to mentioning that all these methods require some preparation in terms of selecting a representative sample of customers`. But, since we are monitoring a community, usually online, the typical tool to support this activity would be Netnography (Design Proposition # 3).

Customers can also be involved in the deciding on the requirements to consider in the following innovation process activities (Design Proposition # 15).

### *Ideation*

There are two basic approaches to Idea Generation: the ***dreamcatching route***, which operates as an always-open suggestion box, and ***contest route***, which serves as a time-limited event. Research, backed up by several independent studies, has shown that the always-open suggestion programs tend to disintegrate over time. They are often launched with a lot of hype, but after the initial hundred-or-so ideas, the idea flow soon becomes a trickle of just a couple of ideas per week. Research conducted by Imaginatik in 1998 found that time-based events - or 'campaigns' - yield a much higher volume of ideas, in terms of absolute numbers and quality. In comparison to, e.g. ongoing employee suggestion programs, the yield is four- to ten-fold greater, even though events last typically for just four weeks. This created an apparent paradox: participants had less time to contribute but they submitted a greater number of high quality ideas. In-depth analysis revealed that the artificial time restrictions generate significant user demand to make contributions, and provide an incentive for people not to procrastinate. We also found that business sponsors are more likely to commit to a short event or project, and follow through with the results. The event-based approach is highly suited to short term projects that require input from a broad audience. Typical events include strategic planning, early stage product development, 'emergency' cost reductions, and crisis management. The event-based approach has also proved useful as a means for companies to test the overall approach of Idea Management in their business prior to full-

scale investment. In some cases, organizations have attempted to run time-limited campaigns without a specialized tool, and instead make use of existing software such as e-mail, Word documents and the occasional Excel spreadsheet for evaluations. This method can be sufficient when few people are involved in the process, but the manual process is quickly overwhelmed when faced with a volume of ideas. Just 100 ideas can produce 500 e-mails to reviewers, over 2,000 e-mailed comments, and so on, and so on, see the IBM Innovation Jam 2006 case. Studies have shown that a diversity of ideas and opinions are needed to generate high quality solutions, and that can only be achieved through the involvement of many people in the process. Companies then need to have some form of process support to handle the volume and quickly focus on the desired end result (Design Proposition # 10, Design Proposition # 17): a small number of high impact ideas that can be readily implemented. The event-based approach can be applied in parallel to the ongoing approach of customer suggestion systems.

If customers participate in the idea generation the followed method entails that participants perform individual assignments before engaging in group idea generation (Girotra et al., 2008). This means that the challenge of generating and submitting ideas initially is an individual challenge. After this step, if necessary, groups can be formed to enhance and enrich the individual ideas.

### **Development Stage**

Customer co-creation may take the form of periodic review of designs in process (e.g., mockups, prototypes, partial products) or periodic attendance at design meetings to discuss tradeoffs. When there are one or two large customers (an OEM relationship), each customer may be represented directly (follow the Employment Route). When the number of customers is large, several individuals may be chosen to represent the general population (the Touchstone Route). In the case of a highly complex product, a customer may become a formal design partner (Employment). The marketing professional can play an important role in engaging the customers in the design process by identifying and recruiting customer representatives, and by managing the relationships during the process.

In the design and development activities firms should take in mind that these activities are interaction intensive and can take quite some time, i.e. they are not executed in one or two meetings. To have participating customers travel on and off to each meeting poses an important problem on their participation. Employing online participation and collaboration tools is in such a case a suitable consideration. When participants are given specific and autonomous design and development tasks, they should also be enabled to work on these tasks, without having to travel to the firm each time. In such situations online tools also are appropriate. The best way to involve customers in design and development tasks is therefore the employment of online tools, like collaboration tools and design tools. If the employment of online tools is not possible, or the firm does not prefer to use these online tools, temporary employment of the participating customers should be considered, as described in the LEGO case (section 5.6). However, firms should refrain from trying to manage and motivate these 'temporary employees' in a similar way as ordinary employees, since these participants are volunteers and contribute in a creative way.

Customers will participate sooner when it is about a product category where there are large and noticeable differences of product attributes among different items or brands - whether physical or merely perceived -, and when these differences are perceived to be of significant importance (Etgar, 2008). Inviting customers to develop a new alternative for e.g. salt, will probably attract less people to volunteer for participation, than in the case of developing a new personal computer. Although the same decisions apply to either

product category, firms should be aware of the chance that in the first case participants will be harder to recruit than in the second case.

Prototype testing in advance during NSD will be difficult or even impossible because of the nature of services – they are co-produced with customers when demanded (Matthing et al., 2004). Because of this feature it is recommended to test new service prototypes and concepts in special locations or on special customers, where their feedback is requested.

Users might also have difficulties in providing valid evaluations of concepts and prototypes as no reference product for the radical innovation exists (Schoormans et al., 1995). We therefore propose to focus on meaning and perception that the customer gives to radical innovation prototypes in the context of their outcomes, by concentrating on metaphors, analogies and outcomes (Design Proposition # 8).

### **Marketing and commercialization stage**

Aside from advertising tests, giving feedback on marketing plans and concepts, acting as a launching customer and providing with samples (see Table 10-4) you can involve customers to diffuse your innovation through their word of mouth.

Social Media has changed the world of marketing forever. Customers, prospects and competitors share information every day through Social Media channels that build relationships, strengthen brands and increase business prospects. And countless people—from start-ups and individuals to well-established companies—are creating sizable returns from social media sites like Twitter, LinkedIn and Facebook. What do all of these people have in common? They know how to use social media tools to generate the kind of exposure that converts relationships to prospects and prospects to sales. And you can, too. Companies attempting to use social networks should develop relationships with key customers over a period of time and progressively refine the social network profiles of those individuals. In this way, the most suitable individuals can be targeted with the right information, products and promotions in the most cost-effective way.

New technologies and methods of communication are emerging, enabling people to tap into the crowd at any time. The crowd is always on, always there, ready for our questions, ready to respond. The crowd is the most powerful knowledge base we know. And it is free to all to access. So, here you are presented with a very efficient and effective platform to market and commercialize your new ideas, products or services. But, don't shove your marketing down people's throats. Social networks succeed for a simple reason; the principle that binds them together is based on conversation and interaction. The way to engage with people is to be interesting and interactive. Doing this implies individual interactions. Not massive marketing by posting ads, banners and product placements on websites. Social networking is about participation and interaction. So the quickest way to build a reputation is to crassly promote yourself, but the reputation that results won't be what you wanted. Instead, whenever anyone searches on your name, they will find a torrent of abuse explaining what a bad company and person you are.

What should you do? One thing you could do is to form an advisory board of your key customers. This group can serve as a sounding board while a product moves through the developmental cycle, and they may become early adopters of the product. Also, advisory board members tend to develop a sense of ownership for the product and become vocal "champions," thereby creating powerful third-party endorsements that can compliment early sales efforts. Another way would be to create a brand community and have your fans create their own ads, promotional films, etc. Maintain this community creating brand fests or other events, like Harley Davidson does, to keep the fire alive (Schouten &

McAlexander, 1995). Such community members will inadvertently become your biggest advocates. Their opinion matters more to other customers than yours.

### **Re-innovation or use stage**

During this stage it is important to have customers report their complaints or suggestions for improvements regarding the launched product or service. Monitoring user-user interactions, as described above, can also elicit new needs, wants and ideas. Travelling along the contest route can also be appropriate when looking for raw ideas, as described above in Ideation.

However, when customers are encouraged to create, some will push beyond the intended limits. They can make modifications to the product itself or, at other times, extend the design tools; in both cases, they may publicize their work to the user community and may offer their modifications to others. These changes are commonly referred to as "hacks," since they are outside the scope of the company's specifications. It can be uncomfortable for a company to stand by as users "hack" its product, and it is easy to feel that you are losing control, that most "hackers" have evil motives, and that your intellectual property may be under attack. Companies should be selective about intervening, however, since many of these "hacks" are well intentioned and they actually improve or extend the product to everyone's benefit—including the company's. The company's role is to act as the customer champion and hold back lawyers who are overly zealous in defending the company's products—as long as the hacks are beneficial to the user community and don't result in the outright theft of intellectual or real property.

We will now discuss the four main routes.

## **10.5 Dreamcatching**

### ***10.5.1 General description***

As indicated before, the dreamcatching route is a metaphor for monitoring customers and users in their interactions with other users and with the firms, in order to discover possible innovation opportunities. The involvement of the customer in such a situation can be classified as "customer as a user" (Nambisan, 2002). Tapscott and Williams (2007) refer to this mode of customer co-creation as *emergent or serendipitous* innovation: users create a new product, application or modification by making use of company made available platforms (Design Proposition # 5), of which the company becomes aware, and improve, scale and commercialize the innovation. When timely, customers could also be requested to react on some general or more specific questions, such as concepts, ideas, and prototypes from other users. As depicted in Design Proposition # 5, the appropriate interventions are to create and support a customer community, to provide a basic product or service with which users can freely experiment, while exchanging experiences, ideas, improvements, and such, with each other. The users can also interact with the company on issues like complaints, suggestions, service improvement, and such. This approach can be extremely effective in cases of uncertainty regarding possible product improvements or incremental innovations, of which requirements haven't been defined yet (Design Proposition # 10), e.g. the FIAT 500 case in Appendix D. By applying this approach in a transparent way (Design Proposition # 7), not to promise any rewards in advance (Design Proposition # 19) and involving all users in the screening of ideas and suggestions (Design Proposition # 15) through crowdsourcing techniques (Design Proposition # 26) we will get the most of its potential.

### ***10.5.2 Preparing for the dreamcatching route***

Preparations to follow the dreamcatching route consist of the development of a user community (described above) and its monitoring, in order to discover opportunities. To monitor communities, companies can monitor users' blogs, start a company blog to start and support a dialogue with users, check out social networks for the use of their company's name, products or brands, tapping into consumer-generated content and media sites<sup>30</sup> (YouTube, Flickr). Using social media monitoring, we scan the public social internet to derive insight around a particular brand, category, occasion, need state or demographic. We then analyze this content and use the insights uncovered to define a research agenda to take into a crowdsourcing phase.

If participants encounter any problem or raise specific questions during the course of interaction, these need to be processed and dealt with promptly. In addition, most participants also appreciate or expect direct feedback on their contributions, so this must also be provided immediately, to start with, by thanking them for the contribution and communicating what will be done with it.

People are expected to share their thoughts and ideas and the company manages the communities to ensure that everyone's views are respected so that each person feels encouraged to contribute. Typically, community activities can include asking for opinions about anything from a company's products and services to marketing messages and ads. But activities can also include more open ended questions designed to elicit the community members' ideas about more general topics that spark discussion and inform the company about what is really important in their worlds. For example, a brokerage client might ask a community of investors what they think the stock market's next move might be, while a consumer products company might ask its members about fashion or culture. Whatever the situation, the company gathers the "Voice of the Customer" from which flow the serendipitous ideas and insights that enable it to surely and handily make decisions about products, features, services, messages, timing, and much more.

### ***10.5.3 Recommended actions***

Finally, we will provide some action points for companies to follow the Dreamcatching Route in an effective and efficient way. The company should identify all the blogs, websites and other communities where bloggers and their readers converse about the company, its products and its competitors. They should monitor the conversation to determine the marketplace 'buzz'. Knowledge of where and why a company is being praised or criticized would allow the marketing managers to respond to these criticisms. Furthermore, they can identify potential problems at an early stage and take corrective actions before the problem becomes a full-blown issue.

#### **Collect information about your customers (CKM)**

Some simple steps to get started:

- Tap into the conversation – go to sites like Google, Technorati and Yahoo and sign up for services that notify you by e-mail when your company is mentioned online. In some cases, they work as fast as a few minutes after an item is posted.
- Listen – when you find people talking about you, first hear what they have to say. Spend a few days just getting a sense of their perspective and agenda.

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<sup>30</sup> For example, LEGO experiences that many users make movies of their creations and publish these on YouTube. These movies serve as an inspiration to other consumers, but also to the company.

- Enter the conversation – once you have a sense of who it is you're dealing with, enter cautiously into the conversation via comments and responses and engage these influencers. Be careful: defensiveness and combativeness are considered bad behavior. Acknowledge what they have to say and respect it, even if you don't agree.
- Co-opt the enthusiasts – when you figure out who's passionate about your product or company, enlist them as trusted advisers. Offer freebies, T-shirts and access to developers and executives. Invite them to visit the company and see your development operation. Make them feel like they're special to you. They should be.
- Create affinity programs – your customers are your best marketers. Give enthusiasts incentives to find new prospects, being careful not to reward them directly for positive commentary. That's considered a bad form. Instead, encourage them to set up branded areas on their sites where interested prospects can contact you directly.

### **Create a community for your customers or users**

After you have collected information about whom and where your customers are, and what motivates them, create a community for them. A good place to start is by working with your online customers to create an online meeting place. Ideally, you can identify customers who are already participating in online forums and blogs, because these customers are already familiar with online communities. Once you have created an online meeting place for your customers, it will become easier for them to share information and recruit new customers for your brand and products. This is another example of letting customers be evangelists. *Key action point:* Make every effort to create a sense of community among your customers. Your goal should be to make it as easy as possible for your customers to come together and share information, and their love of your brand. Your company should also make every effort to itself be a member of these communities, whether they are online, or offline. Doing so will not only help your company accumulate invaluable feedback from your customers but also make them more likely to evangelize your brand—and increase the chance that you'll convert customers who visit these communities into fellow evangelists.

### **Be accessible**

Make sure customers have as many avenues as possible to give feedback, and do everything to encourage that feedback—online and offline. Simply taking the time to listen to customers, showing them that you respect them and value their input, is often enough to create loyal customer that can act as evangelists. Customers appreciate and value brands that appreciate and value them. *Key action point:* Create and maintain as many channels of communication as possible between you and your customers. Add areas on your Web site and blog where customers can leave feedback, including suggestions. Make sure your product packaging includes information on how to contact customer service, and how to leave suggestions and feedback. Never make your customer have to look for this information; make all your company's contact information as easily available as possible.

### **Monitor customer feedback**

Understand that loyal customers may be passionate about your brand but that doesn't mean they won't criticize you as well. Loyal customers feel a sense of ownership in a brand, and if they think that a company is doing something that dilutes the brand they will not hesitate to let the company know their feelings. But remember that such a complaint or criticism is rooted in passion, and where there is passion there's a potential evangelist. *Key action point:* Make it easy for customers to leave you feedback. Add contact forms or email links to your Web site and blog, and include contact information on your product's packaging and any emails you send. And acknowledge receipt of the

feedback. Doing so not only helps your company better market itself but also gives you a chance to convert a complainer into a loyal customer. Ignoring feedback could lead to negative perceptions about the company or brand.

### **Let your loyal or best customers be evangelists**

Do everything you can to empower your existing customers. This point ties into earlier ones: Make sure that they have easy access to any information about your brand or product, as well as many feedback channels as possible. Consider launching a blogger-outreach program for your customers who are also bloggers. This would make it easier for your evangelists to promote your brand or products in the blogosphere. *Key action point:* View your evangelists as volunteer salespeople for your brand, because that's exactly what they are. Give them all the information and tools they need to promote your brand to other customers. Consider giving free samples to your evangelists, or creating an outreach program around them. Make it as easy as possible for your evangelists to promote your brand to everyone they come in contact with.

### **Apply netnography**

Apply ethnographic research to on-line communities as a better, faster and more cost effective way of generating insights. Use a combination of observational netnography to uncover insights by studying members of a community and participatory netnography, to take more of an active role in a community. Netnography uses a range of web 2.0 qualitative research tools such as on-line focus groups, diaries, forums, blogs, chat and multimedia functionality. These tools can be brought together within a bespoke research community to help companies interact directly with groups of customers or advocates. Encourage participants to connect and interact with one another. This is important because new insights emerge when you hear customers talking to one another in their natural voices and not simply responding to researchers' questions.

## **10.6 Contest route**

### ***10.6.1 General description***

When looking for a substantially large amount of ideas for a specific (company-defined) problem, the company can (crowd) cast a contest to find a solution to the problem. Through an appeal in the community, consisting of users and customers, the company can rely on discovering one or more solutions to new ideas for a product or service, functional, and sometimes even technical, requirements for products and services, but also design solutions, and not to overlook, ideas for advertising, marketing and diffusing the new product or service. The company collects ideas, assess them, have a jury (ideally the community itself) select the best, and most promising idea(s) and reward the contestant(s) with an appropriate prize.

### ***10.6.2 Preparations for the contest route***

As stated, it is useful to provide a community a forum for contributing new ideas. The web-based idea submission form is one method, although that provides limited feedback even if each submission receives an acknowledgement. A more powerful method is an on-line forum in which customers can see and respond to the submissions of others—it becomes a community where customers can interact. The company can increase the excitement by having contests for the best/most unusual/"I wish I had thought of that" ideas (or any other categories one can think of). While this involves more effort to set up and monitor, it is much more effective at getting the customers engaged. Any prizes the company awards will be inexpensive relative to the information you will get in return.



Participants can be notified or invited to undertake required actions or make specific contributions through emails or banners, if necessary through a trustworthy online community member, e.g. when the participants' names are not known to the firm. If participants encounter any problem or raise specific questions during the course of interaction, these need to be processed and dealt with promptly. In addition, most participants also appreciate or expect direct feedback on their contributions, so this must also be provided immediately, to start with, by thanking them for the contribution and communicating what will be done with it.

In this route the use of idea boxes and competitions for customers serve as tools to extract ideas and innovations from other than designers and engineers tasked for a particular R&D project. Recently tools and methods to further develop the mechanism have been created. One example is an Internet-based Toolkits for Idea Competitions (TIC) (Piller & Walcher, 2006), a way for manufacturers to access innovative ideas and solutions from users.

### ***10.6.3 Recommended actions***

#### **Promote the contest**

First of all you have to promote this, either through your existing channels or creating new ones (such as a specific web site). Emailing potential participants is therefore a 'personal' approach that may elicit a larger response. Making use of traditional communication channels, such as newspapers, television, radio and others also comes of handy. But in these times you might also consider a promotion of the contest via social media, like Facebook, MySpace, Hyves, YouTube, etc. Blogging about the contest is also recommended.

#### **Use crowdsourcing techniques**

Harnessing the wisdom of the crowd explores insights further. Crowdsourcing can be used to uncover problems and divine top line solutions to a particular issue. This route can also be a really useful way to try and quantify opinions and issues. Think of crowdsourcing as a way to ask qualitative questions of a quantitative sample.

#### **Provide clear and challenging instructions on what is expected**

Customers would like to contribute when the task is clear and challenging; easy tasks are ignored and unclear instructions lead to confusion on what is expected. So, you need to define clearly what you expect from participants, be transparent on how you process the contributions, and decide on their usability.

#### **Respect your customers**

Consider the customers you work with as experts in their own right, whether they are technology addicts helping you generate new mobile applications, or housewives working on repositioning a globally renowned air freshener. Whatever their background or particular expert perspective on life, approach them as equals and partners in the process. Do not ridicule or ignore ideas, do not procrastinate the process, giving participants the idea that they are not taken seriously.

#### **Provide and explain the proper tools for participation**

In online communities, members can have a whole range of social media tools available to them, from multimedia uploading facilities to an instant status update tool, in order to express themselves and demonstrate in their own words, pictures and actions how a particular issue plays out in their lives and minds. But, you might want to standardize the format for inputs, and thus need to develop a specific tool for submission of the

participants' contribution. Be aware that participants will not be familiar with the tool, so provide instructions or training for proper application.

### **Monitor and acknowledge responses**

Then you need somebody monitoring and moderating response. Maybe you wish to check they are decent ideas and original and do not breach any patent (of course it depends on how far you want to go in making sure that the content you receive and expose does not cause issues). Checking may range from doing some research, to running some tests (if it is software code), to browsing licenses and IPs.

### **Process all submissions**

If you allow the audience to rate ideas, then you need to make sure that every idea is given a chance, so you may have to edit some of the content to bring them up to the same presentation standard that puts them pretty much on equal footing.

When the submissions are closed you are left with many applications and how they are rated. What do you do with them? You need to go deeper in each of them – possibly starting from those with higher rating – and check whether they make sense in your architecture and really fit your needs. Now pick the best solution, but be aware this is still a half-baked idea, an incomplete design, a prototype application, which needs to be turned into something you and your stakeholders can trust. Launch another round of crowdsourcing to get the version 0.2, but try to engage with other participants than before. You can't expect that the same community will suddenly come with the ultimate answer or volunteer to work at very low or no cost at all, again. And even if it did, how would you get assurance that the result meets all your functional and non-functional requirements? At some point in time, in this seamlessly participative process, the line between the client and the supplier role must be drawn. It is very possible that the end result will be much better than what it would be following a more traditional process.

### **Be prepared for the tsunami**

To make the most of the excitement, interest and motivation of contestants companies need to be prepared to act on the volume of good ideas generated. The success of the first jam caught IBM by surprise and they weren't prepared for the large body of interest. Over time they have developed methodologies to effectively facilitate large groups to capture the ideas and refine them further. So, be prepared and reserve sufficient resources to deal with a large stream of ideas.

### **Reward appropriately**

It is not sufficient to promise rewards for excellent ideas that lead to a killer app. Most people do not believe that they are capable of ever coming with such an idea. This will inhibit them from participation. So, reward the attempts, not the results. Rewarding attempts leads to better results (de Bono, 1998).

## **10.7 Touchstone route**

### ***10.7.1 General description***

Especially for situations where the company has a very fine idea or solution for the new product or service (Design Proposition # 9: company initiated innovations and 'closed mode' innovations) it may want to test its ideas, concepts, prototypes with customers to find out whether the idea is correct or needs to be enhanced on the basis of customers' insights. This can be done for the output of all innovation activities and stages, such as ideas, functional and technical requirements, designs, concepts, prototypes, product proposals, advertising and marketing ideas or concepts, by exposing these to customers,

that respond to the questions “What do you think of this idea or concept?” and “How can this idea or concept be improved (to fit your needs better)?”

Following this route can help break the yo-yo effect of research and development, where companies go back and forward between creative agencies, research agencies and their audience. By working with your customers, rather than directing stuff at them in the hope that it will stick, companies get a real sense of what works and what doesn’t as the ideation takes place. Ideas emerge, develop, are refined and validated in collaboration with your audience, in real time. No need to wait around for endless tests.

### ***10.7.2 Preparations for the touchstone route***

#### **Virtual Focus Groups**

Focus group interviews, where a group of consumers gather in a room to discuss a product, play an important role in the new product development process. This is also where the first ideas behind many innovations have been generated. With the emergence of blogs, focus group interviews can now be conducted virtually on a website. This allows marketing and innovation teams to recruit participants from all over the world. One is no longer limited to recruiting from one region. Success of focus group interviews depend on the diversity of opinions held by the participants that leads to a lively discussion. This diversity is enhanced when participants are from different regions or countries. Moreover, virtual focus group interviews are cheaper to conduct, as participants do not have to travel from their house to interview site. They can participate from the privacy of their homes or offices. This privacy also ensures that participants are more honest with their opinion and less susceptible to groupthink.

#### **Governmental and community innovation tools to support citizen participation**

Techniques for participation have evolved as a result of the criticism of citizen involvement as being time-consuming, inefficient, and not very productive (Rosener, 1978). Usually municipalities involve citizens by community meetings or public hearings, where typically only the most aggressive personalities tend to participate, thus dominating the discussion (Creighton, 1994), and decision are made through voting. The key to making community design work effectively is a range of techniques enabling professionals and citizens to creatively collaborate, where voting is replaced by consensus decision making (Sanoff, 2005).

A wide range of techniques are available. In general, many of the techniques facilitate citizens’ awareness to environmental situations, and help activate their creative thinking. The techniques can be classified into three major categories: awareness methods (newspapers, planned tours and walks through the environment), group-interaction methods (surveys, questionnaires and face-to-face interviews), and indirect methods (workshops, focus groups, gaming, and the charette process) (Sanoff, 2005).

A *charette* is an intensive participatory process lasting several days or longer, depending on the complexity of the problem. It convenes interest groups in a series of interactive meetings aimed at solving particular problems. Phases of the charette process may include workshops or working sessions that engage participants in the development of ideas, recommendations, and decisions (Sanoff, 2005).

### ***10.7.3 Recommended actions***

#### **Repeatedly test ideas and concepts**

We would advocate taking NPD outputs like ideas and concepts – even when submitted by customers in earlier stages – back online for further refinement and validation. One invaluable aspect of co-creation outputs is their articulation in consumer language rather than marketing speak, and by taking concepts back online into a community of fresh, critical and unbiased target consumers we have the opportunity to expose concepts to a relevant and constructively critical audience. Community members will pick ideas apart on the level of individual words and phrases, as well as comment on visualization and other aspects of articulation, to help ensure that the ideas are expressed as clearly and relevantly as possible.

## **10.8 Employment route**

### ***10.8.1 General description***

Typically, this route usually follows face-to-face meetings and workshops between the NPD-team and customer participants – sessions designed to bring professionals and customers together to problem solve, design and develop. Capitalizing on the insight, understanding and potentially initial solutions that have been derived through social media analysis, crowdsourcing and online community work, the employment route is an opportunity to really build on this learning and develop worked up solutions. This kind of user involvement is not normally connected to customer as user, but may be found as a challenge in “users as developers” within new product development (Nambisan, 2002).

### ***10.8.2 Preparations for the employment route***

Prepare for this route as if you are preparing for the recruitment of new employees. Define what their job and task is going to be (Design Proposition # 7, Design Proposition # 18), prepare for proper training (Design Proposition # 16), communication (Design Proposition # 28), and reward (Design Proposition # 19, Design Proposition # 20). Recruitment and screening can be achieved by monitoring customer communities (Design Proposition # 5) or ask around (Design Proposition # 13).

### ***10.8.3 Recommended actions***

#### **Select potential participants carefully**

There is saying that only 1% of your customers are capable of being creative and sourceful to collaborate in an active way with you. We have elaborated that, in principle, everybody can be creative and sourceful. However, not everyone is inclined to be stimulated or seduced to help you out, particularly when it looks like working for you. Only motivated, and often experienced customers, will show interest and are capable of taking part in the invitation (Design Proposition # 7, Design Proposition # 14). It means looking at your potential participants not just as customers that want to buy something from you but as people who want to have a deeper and more meaningful relationship with you. Therefore, select the participants thoroughly by interviewing them on their motivations, their commitment and their needs. It quickly reveals that there are all sorts of customers with different levels of passion, interaction and sizes of network who want to engage with your brand. Their desire to do things with you varies, so they need to be engaged with differently.

### **Look for (additional) lead users**

You are requiring a great sacrifice from participants to commit resources like time, knowledge and creativity to your benefit. So, you will want it to be worth the effort. To increase your chance on good input, you might want to involve an additional amount of lead users in the project. To find them, simply ask around in the customer community (Design Proposition # 13). See also our general guidelines.

### **Treat participants as your own employees**

As has been elaborated, we want an active and intense participation from the participating customers, as if they are members of the NPD/NSD-team (Tomes et al., 1996), which we have depicted in Design Proposition # 27). Participants should be treated as active equals rather than as passive respondents in the brand marketing process. By giving customers more active and direct responsibility in your research, innovation and planning approach you are able to stay much closer to your customers' ever changing needs. It also means you are able to create better insights, product ideas and social media strategies; dramatically speed up the innovation process and radically reduce the cost of new product development.

Consider the customers you work with as experts in their own right, whether they are technology addicts helping you generate new mobile applications, or housewives working on repositioning a globally renowned air freshener. Whatever their background or particular expert perspective on life, approach them as equals and partners in the process. Participating customers will therefore be treated as firm innovation team members: they will be treated equally. That is that in physical project contexts they participate in team meetings and interact with team members.

Some firms believe firmly in the fact that employing motivated users rather than industry professionals or MBAs can increase creativity of the firm, because it is assumed that it is easier to teach a fun hog to be a businessman than to teach a businessman how to be a fun hog (Winsor, 2006). Bring customers into your business webs and give them lead roles in developing next-generation products and services. This may mean adjusting business models and revamping internal processes to enable better collaboration with users. It certainly means avoiding practices of blocking, impeding or disabling customer innovations (Tapscott & Williams, 2007). Firms, however, must be aware that they do not have the same degree of freedom regarding customer co-creators as they often have with employees. Firing a customer participant may alter the demand for a product or loyalty (Lengnick-Hall, 1996). Also, firms must realize that customers want to be in control, denying any form of external control (Ljungberg, 2000).

Initially, you may encounter customer resistance to the idea of such close collaboration. In that case, you must take time to educate them about the benefits of their presence. Without the customer's full-time presence, the (rapid iterative) innovation process can not be executed successfully. A fully involved customer provides requirements when needed, answers questions immediately, and performs testing as soon as the latest iteration is available. Theoretically, with this approach, there is no delay at all. In such a case the company should take in mind that customers will need additional training and that they can understand the use and purposes of the tools (Design Proposition # 16 and Design Proposition # 7).

### **Prefer face-to-face communication**

When embarking on such a journey, companies will encounter many tools and methods. In all our cases, however, the most valuable experience for designers was the close, face-to-face interaction with users, allowing for a transfer of tacit knowledge. There are

many ways to involve users in innovation, but it seems that all require some level of involvement by the designers themselves.

Communication also improves when the customer is located with the development team. Individuals can communicate in a direct and personal manner. There's no need to leave voicemail messages or swap e-mails; the customer is sitting right there with you. When a concept needs testing, the developers can look over the customer's shoulder. When problems arise, the project manager can discuss them immediately with the customer. Communication is fast and direct, reducing the opportunity for mix-ups.

### **Stimulate/Activate participants to trigger insights through team playing**

Once you start to co-create, you have to stimulate participants to own the brief by showing you how they think, feel and experience, in order to discover trends and trigger valuable customer insights. From these insight triggers, participants, stakeholders and experts then should work together in constantly rotating teams to generate lots of disruptive ideas. As a group all the customers, stakeholders and experts select their most engaging ideas, before another team of customers then take these and refine them further. Once customers have refined the selected ideas they then pitch them to the core stakeholder team, who then make the final cut.

Allow for constant, spontaneous customer co-creation. Judge not your customer by the thickness of their wallet, but by the content of their contribution and desire for that contribution to be completely on their terms.

## **10.9 Summary of the protocol**

We can now summarize all these findings in some general do's and don'ts:

1. It does not matter in which industry or sector you are employed; your customers possess knowledge and experience about the use of your product, which you can harness for your NPD-initiatives. This will enhance the success of your innovation, and your customers' loyalty. The earlier you involve them in a certain project, the better the results will be.
2. Carefully decide on this customer co-creation by identifying in advance what benefits you want to get from this and whether your customers are easy to locate, access and cooperative. Communicate your intentions and objectives upon invitation. Be transparent about these. Do not underestimate their power to neglect or even undermine your invitation to participate, when you're not being open.
3. You can co-create with your customers in every phase of the NPD, you can use your own tools and techniques, as long as you do not make things too complicated for them. That means that you can train them in the use of these techniques – this will lead to better inputs from them. But keep in mind, it is not this toolbox that determines the success. Nor is it the technology – although engaging many customers at a time is enabled by applying online methods. It is the dialogue that you have with your customers that will do the trick. Therefore, use additional techniques that facilitate this dialogue. In that respect, choose participants that are willing and able to take part in that dialogue.
4. Do not rely solely on a few important, financially promising or lead customers. On the other hand, do not think that a large amount of participants will always be helpful. Create a diverse participation by alternating customers in phase or activities of an amount you can handle. This will also prevent group thinking, the preference for one's own ideas or even boredom in a lasting process. In many online situations you might

aim for a larger participation, but do this only when you do not have to handle their inputs simultaneously or have sufficient resources to handle this.

5. Finally, treat your customer respectfully. Reward him properly and treat him as one of the NPD-team, by including him in decision-making, be transparent about royalties and (IP) rights. But, be certain that your whole organization adopts this attitude. Any mistake can be catastrophic for you customers' willingness to participate.

## **10.10 Conclusion to this chapter**

In this chapter we have introduced the design of the protocol. Through scrutinizing and analyzing the 28 design propositions in relation to one another and some pre-defined design requirements, we have identified four main routes – metaphorically named the dreamcatching, contest, touchstone and employment route – that a company can follow when aiming to involve customers in the innovation process. To decide which route(s) is or are appropriate we have discussed some premises and considerations – objectives for co-creation, stages and contributions for co-creation, type and openness of innovation – that a company has to assess systematically. Each route was elaborated on, providing preparation steps and do's and don'ts for an effective and efficient contribution from customers. The four routes are also interrelated and do not exclude one another, but nevertheless provide a company with the optimal approach for 3CI. The 3CI-protocol will therefore be a robust, handy guideline for companies to involve their customers in innovations. Because of the systematic and rigorous analysis and synthesis of theory and practice, we expect the protocol to be applicable in most situations. To test and prove the correctness of this expectation we first need to validate the design. This design step is undertaken in the next chapter.

# Chapter 11 Validation of the protocol

## 11.1 Introduction to Chapter 11

To prove that the designed protocol works, it has to be validated. In Section 3.3 we have argued that the best way to provide that proof is to test the protocol in real practice situations, that is, by firms in innovation projects where customers are (to be) involved. But, we have also argued that this could be a cumbersome and time costing activity, since we need to be aware of and find firms that have the intention to both undertake an innovation initiative and have plans to involve customers. And, when such firms are found, the throughput time of an innovation process – or a mere phase of the process – also takes the necessary time and effort. Finally, assessing the quality of the protocol in only one project would not suffice, requiring at least some four to six projects to make a valid statement about it. Because of these risks, potential testers might also be reluctant in volunteering for the protocol testing.

We therefore proposed to conduct the protocol validation by having it reviewed by some potential users, some experts and some scholars, and to base the conclusion of its validity on the opinions of these reviewers. In this chapter we will describe the method, the process and results of the review to validate the protocol.

## 11.2 Method of review

As was discussed in 3.5 design science incorporates the testing and validation of a design, preferably by means of a field test (van Aken et al., 2007). We have indicated that because of the time required we refrained from field testing the protocol. Instead, more as a first step towards validation in practice, we fell back on peer consultation or review, through which the protocol can gain in credibility in the eyes of (potential) users (Tan, 2010).

The review was conducted in two stages, the latter one consisting of two steps. The first stage was a co-creation session with potential users in which the 28 design propositions were presented as elements of the protocol, and participants were able to comment them and suggest improvements. It was an important step in the design of the protocol, since it also applied the co-creation with potential users in its development. Organizational scholars have concluded that people are likely to react more favourably and enhance their commitment to carry out decisions in which they participated than those in which they did not. Results of research on research utilization are consistent with this conclusion. Researchers repeatedly report that users who participate in earlier phases of research react favourably to results. Users who participate in research may feel supportive because they have had greater opportunities to shape the research to provide results that support what they want to do or are already doing (Beyer & Trice, 1982). Thus, it is tempting to conclude, as many have, that user participation in research is positively related and perhaps essential to its utilization. Because of this mechanism, a co-creation session was held with 8 practitioners in the field of marketing and product/service development, where the initial design propositions were presented, illustrated with cases, and discussed on practicality implications. The result of this session not only entailed a confirmation of most design proposition to be relevant and plausible, but also in the enhancement of some of them. In this way design propositions were co-created with potential users of this protocol.

In the second stage, reviewers received a version of the protocol and were requested to judge this protocol on effectiveness, i.e. to tell whether they perceive the application of



the 3CI protocol as delivering effective and efficient customer input. In the case of divergent opinions, a Delphi (Linstone & Turoff, 2002) was scheduled to reach consensus on the usability of the protocol. Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. To accomplish this "structured communication" there is provided: some feedback of individual contributions of information and knowledge; some assessment of the group judgment or view; some opportunity for individuals to revise views; and some degree of anonymity for the individual responses. In practice, the Delphi is conducted through 'rounds', each consisting of a short period in which participants respond to the problem (and questions) to a moderator. The moderator collects and aggregates all insights and presents every participant with the different views, but omitting the identity of the respondent, and providing some statistics along, e.g. frequency of certain answers, averages for insights and deviations or ranges in answers. Through means of this moderator feedback the participants are requested to re-evaluate their original answers and provide a new corresponding response to the moderator. This is repeated until the moderator decides that the answers show sufficient consensus or convergence. Usually this convergence is reached after 3 or 4 rounds.

A panel discussion was the option to facilitate group interaction, since opinions are formed in a social context. The Delphi technique has been selected since reviewers are geographically dispersed (several countries) and its potential to match or outdo the conventional moderated group discussion.

As a matter of fact, what we have been doing in both the first and the second stage of validation was to follow our own suggested touchstone route where it is the idea to present a concept, prototype, idea or, in this case, a design and to have the customer/user react and respond to it.

## **11.3 First stage review process and results: co-creation**

### ***11.3.1 Co-creation process***

In the first stage, the co-creation session, reviewers selected themselves. On request of the director of a managers' network society, the author agreed on presenting his findings in a workshop of half a day. The network society has somewhat over 40 member organizations (governmental and not-for-profit organizations included), represented by managers or consultants in the area of marketing, customer contact or customer care. The society fulfills its memberships by frequently organizing meetings, gatherings, conferences, etc. on the topic of being connected with the customer. Subjects like customer retention (e.g. Net Promoter Score, see Reichheld 2006), building customer experience (e.g. Shaw and Ivens 2005), complaints handling, etc. In this context the workshop was organized, for which 10 members applied. On May 28 2009 this co-creation session took place with 9 participants, including the author. Participants were from a diversity of organizations, including governmental ones.

### ***11.3.2 Co-creation results***

This first stage of review, the co-creation session, revealed a high degree of endorsement and agreement by the potential users with the design propositions – there were few comments on the propositions. The only new insight which was gathered with this review was that participants regarded the design protocol applicable to all kinds of customers, not end users alone. In this respect the discussion showed that organizations should have a clear vision of the innovation that is being developed and its intended users, and to focus the participation on user relevant contributions from the participants. For example,

the Boeing 787 Dreamliner development demonstrates that a diversity of end users can be identified, such as pilots, passengers, cabin crew, maintenance personnel, traffic controllers, etc. To involve a mechanic from the maintenance crew requires to confine his or her contribution to aspects regarding the maintenance of the aircraft, and not, for instance, the comfort of the business class seats, for which business class travelers are the most likely source for contributions. Based on this insight the protocol outlines were augmented with paragraph dealing with the concept of *end user*.

## 11.4 Second stage review

### 11.4.1 Review process

The reviewers were selected by the author, making use of his business network. A list of 30 potential contributors was drawn, including experts that have been interviewed, scholars with affinity to the subject and potential users, consisting of managers and consultants who may be tasked with the subject. From this list, a total of 24 (7 academics, 1 intermediary, 3 consultants, 4 experts and 9 potential users) were approached with the question whether they would be interested in conducting the review, along with the announcement that the review could lead to a Delphi, in case of divergent opinions. Potential participants were approached independently of each other by email, not having knowledge about the identity of the others. Because of the summer vacations, several of these potential reviewers were not in office, so the call was re-issued after two weeks. In total, 11 approached individuals agreed on participation, 6 declined explicitly, while no response was received from the other 7 persons. The list of 11 positive respondents contained two (2) academics, one (1) intermediary in co-creation, two (2) consultants in the area of customer participation, three (3) experts, and three (3) potential users. They are based in several countries, such as India, Singapore, Denmark, the US, Germany and the Netherlands. All of them are male respondents, in the age of 35 to 70 years.

The reviewers who have agreed on participation received a pdf-version of the Design Requirements (Chapter 6) and the 3CI-protocol as is rendered in Chapter 10 (the protocol version before reviewing), including the referred appendixes containing checklists, diagrams, etc. A questionnaire to assist them in the review was included (see Appendix I), consisting of questions about the design requirements, propositions, general guidelines, protocol routes and the decision criteria for a certain route, all concerning the content, the formulation and the presentation of the elements. In addition, the question was raised whether the protocol is usable (leading to its intended outcomes, i.e. effective and efficient customer input), comprehensive, understandable and appealing. Reviewers could comment on all these aspects and provide suggestions as well.

The reviewers were given an average of two weeks to review the protocol and submit their comments by email or telephone, whichever they preferred. The procedure took place in the period of August 10 to September 25, which exceeded the two weeks because some reviewers indicated to need more time. During the review process one participant (potential user) abandoned after apologizing because of family circumstances. Three reviewers, two experts and one potential user, did not submit their review in time, in spite of repeated reminders. In the end, we received seven (7) reviews – 2 academics, 1 intermediary, 2 consultants, 1 expert, and 1 potential user. At a first glance this amount may seem as insufficient, but conjointly with the first stage input of 8 potential users we have a total of 15 peers that have participated in the validation. In that respect we have complied with our own Design Proposition # 17, implying that we have gathered the minimum amount of participants in the test phase of this protocol development.

The comments and suggestions were collected by the author, systematized, and judged on their impact and consequences for the protocol. Because there was no real divergence in opinions, we abdicated the Delphi, and sufficed with processing the comments and suggestions in the protocol leading to the version 1.0 in 3CI-Protocol version 1.0 on page 395.

This instant 'consensus' can be explained by an alleged 'kindness' from the reviewers for the author or a possible easy way out from spending time to review by consenting with the protocol. Although these possibilities can not be refuted by objective arguments, we judge them unlikely because most of the reviewers can be categorized as weak ties to the author. In that respect, research (Constant et al., 1996) found that, when seeking for advice, information providers incline to give useful advice and solve the problems of information seekers, despite their lack of a personal connection with the seekers more than strong related persons. Because of this we may expect most reviewers to have been willing to provide good, accurate and reliable feedback, consistent Granovetter's (1973) theory of "the strength of weak ties" (Granovetter, 1973).

#### **11.4.2 Review results**

In this sub section we will discuss the reviewers' input and the way the comments are reflected in the relevant parts of the design. In that discussion we will refrain from mentioning the specific source of the comments to prevent recognition of the reviewer.

#### **Syntaxes and pragmatics**

Several remarks were made regarding the choice of words or their spelling. The reviewers presented version did indeed contain several typographic or stylistic mistakes. These have been corrected in the version presented in this thesis, based on reviewers' remarks and our own initiative and will not be discussed here.

#### **General comments**

All reviewers respond that the protocol is comprehensive and useful for the process of customer co-creation in innovations. There were remarks, comments and suggestions regarding specific points and statements in the 3CI Protocol, but altogether there is a consensus that the protocol fulfills its intended outcome: to provide a 'procedure' to the practitioner that guides him/her through the complicated process of involving customers in innovations. All reviewers do, however, suggest improving the readability and overview to prevent users from 'getting lost'. Following, we will discuss the specific comments.

One of the reviewers commented that in his opinion the choice of the protocol name – 3CI, Customer co-creation in innovations – and the target group – customers – was too narrow. He argued that "society involvement in innovations" would have been a better title, since contemporary society, whether consumers, experts, government, suppliers, customers, competitors, and even employees seem to influence firms' offerings more and more than before. In essence, this is the concept of Open Innovation. The reviewer argues that restricting the co-creation to only customers is inherently myopic, leading to the missing of opportunities lying among other stakeholders. In a way, his statement is that anyone can be involved, and that this general co-creation is more beneficial to the innovation.

The reviewer has a valid point. Society demands more and more influence in institutions and organizations. This is reflected in legislation, corporate government habits and market mechanisms. This phenomenon is also reflected in innovation through what von Hippel calls the "democratization of innovation". As a matter of fact, in reviewing the theory of customer co-creation in innovations and developing our design propositions we have acknowledged this societal development of "democratization". However, we chose

to develop a protocol for the involvement of end users instead of people in general because of some practical reasons. To gather effective and efficient input it is necessary for participants to have some knowledge about the (intended) use of the innovation, reflected in the requirement of 'use experience' in Design Proposition # 11 and Design Proposition # 12. Involving just anyone might lead to very heterogeneous and diverging input, making it for the innovating firm difficult to decide on the best course to follow. Second, appealing on society as a whole for innovation contributions may be costly and time consuming, that could turn into a paralysis in the innovation momentum. Third, the protocol is intended for use by the firm, implying that the firm has to be in control of the involvement. Appealing on the 'crowd' leads to wanted, but also unsolicited input from society, impairing the firm's control. Restricting the input to a select portion of the crowd makes the involvement controllable for the firm. Finally, an implicit reason for the restriction lies in the fact that most firms have reservations about engaging with and involving their customers in product or service development. Taking the involvement to a next level by involving society as a whole may prove to be more beneficial and ideal, but might make firms more reluctant.

Several reviewers reacted in a positive sense, qualifying the protocol as robust, with good, solid support from literature. It is an innovative protocol worthy to be tested in innovation projects, an activity which is essential for the validation, according to this reviewer. This validation can be remarkably supported by referring to relevant cases, convincing users. But, in several parts it is difficult to understand by a layman. Some reviewers also made remarks about protocol assertions that can be refuted. For instance, the 'one size fits all' approach is, considering the differences between radical and incremental innovations, between NPD and NSD, and between sectors, daring. Another advice is to also mention the disadvantages or drawbacks of customer co-creation in the protocol. In respect to this last suggestion we can observe that the possible risks and disadvantages were reviewed in the sections about the design propositions, where these propositions included interventions to minimize those risks, e.g. preventing a reduction in intrinsic motivation by administering financial rewards unexpectedly (see Design Propositions # 14, #16, #18, # 19 and # 20).

One reviewer reacted that he could not judge the validity of the protocol without using it in a case. But he did not disapprove of it either. In this respect he preferred to remain neutral regarding the intended outcome whether it would lead to effective customer input.

### **Comments regarding the design requirements**

Design requirements had the purpose to direct the design process of the protocol and are not intended to be explicitly stated in the protocol, since they are incorporated in our design proposition. Suggestions to change, omit or insert design requirements were therefore incorporated immediately in this thesis after having been evaluated on their value for the design. We will, however, discuss these suggestions below, along with how we have evaluated them.

Regarding the design requirements all reviewers agreed with them. One reviewer remarked, however, that they can be stated in a more concrete way. Since they are understood and have been used to guide the design process, we will not adapt the requirements in this sense.

One reviewer observed to miss design requirement for supplier involvement. We observe that this wish does not fit in the scope of this research.

Another reviewer suggested giving the individual requirements different weights in terms of their importance. He considers the requirements #2, #6, #8, #9, #10, #12, #13,

#14, #15 as the essential ones that he fully agrees with. This comment is important in the sense that they should be reflected in the design propositions, which is, as we have concluded in 10.3 (compliance of propositions with requirements), the case.

For the requirement #1 one reviewer points out the complexity of defining an end user in certain B2B or complex value network situations. His preferred way of defining the user of the product or service is the value creation perspective, i.e. as customer / user can be considered every person or role in the value network to which the product represents a direct value proposition. This remark has been processed in the introduction of the requirement.

Design Requirement 2: It was remarked that involving customers in innovations will not lead to efficient processes, since customers usually come with incremental or even not useful ideas and not radical ones, often stalling or disrupting the innovation process when it is aimed at really novel ideas. At this point, we counter this remark with our observation that it is our *desire* to develop a protocol which will lead to *effective and efficient* innovation processes, and have therefore translated this desire into a *requirement*. Whether and how this is complied with, is a challenge which we have entered in the development of our *design propositions*. And as we have seen we have been able to identify the conditions under which it is possible to obtain really novel ideas from customers (see Design Proposition # 3 and Design Proposition # 8) like the application of CKM methods.

The requirement #4 is for one of the reviewers the most questionable one. It is indeed our choice to aim for relevance in the unlimited variety of sectors, products and innovation types, but he is afraid that this makes the task rather heavy and might lead to overly generic result. However, it is not regarded as a disqualifier of the protocol if it is only applicable in certain contexts. It would be expected, though, that these contexts are clearly described.

For the design requirement #5 it is believed that the protocol shall give the user means to identify the specific value of customer involvement in the innovation project as well as potential risks and (examples of) conditions when these have to be given a special attention. This approach will help the user to make his own decision whether in his specific case the value outbalances the risks or vice versa. This comment has been processed in the discussion leading to the particular requirement.

Design requirement 6 is considered a crucial one by one reviewer and should get more attention than presented in the review version. We observe that in the development of the design propositions the major parts of the chapters 8 and 9 are dedicated to fulfilling this design requirement. This leads to 18 design propositions (Design Proposition # 11 - Design Proposition # 28) dealing with the compliance with this requirement, see also Table 10-2. The idea of having the design requirements reviewed in the validation phase was to check whether our assumptions regarding the requirement were correct, not that these are to be presented in the final protocol. We will therefore not incorporate the suggestion of elaborating on the requirement in the protocol.

For the requirement #7 one reviewer sees some value in emphasizing the online and offline approach, but these he considers just one way of classification of the palette of available methods. Therefore he sees the essence in the last part of the description "state where which can be best applied ...". In other words in providing a guidance which of the available tools and approaches are best suited to which specific objective of customer involvement. We agree on this remark, which is reflected in the requirement.

One reviewer suggested defining the statement preceding design requirement 12, "Customer input or involvement should accumulate gradually in the process", into a

separate design requirement. We believe that this requirement is a standard requirement for innovation processes, which is why it is stated, and is not regarded as a protocol requirement. The suggested design requirement is not incorporated.

Design requirement 15 is questioned by one reviewer, since radical and breakthrough innovations require radical and novel techniques. Although we agree with this observation that radical innovations require really novel techniques, we refute this suggestion because the requirement is intended for the adoption of tools to support the involvement, not tools to achieve a certain type or mode of innovation. The requirement to keep the necessary new tools to a minimum is a mere confirmation of organizations' low degree of tool adoption in innovations (Nijssen & Lieshout, 1995). The supportive text for this design requirement has been adapted in this sense.

For the requirement #16, one reviewer believes that a broad and undistorted deployment of the customer input within product development is desired rather than a large representation from this department. We agree on that, and have adapted the relevant introduction to the requirement.

### **Comments regarding the design propositions**

Similar to the design requirements, there is a large consensus on agreement with them. Comments about the propositions reflected mostly comprehension difficulties and insufficient convincement (see below). One reviewer commented that the design propositions should be an integral part of the protocol, in order to understand this; another one observed that this is not needed. We have decided to maintain the propositions as a part of the protocol, but to change their location in the protocol. They are now located at the end of the protocol as a reference. It is suggested to explain the CIMO logic in this respect because users could be either missing evidence that the propositions really do deliver the intended outcomes or that they are the only (or most optimal) way to achieve this objective. It is assumed that we have provided this evidence in the previous chapters of our thesis. Another reviewer commented on several propositions in the sense that they lacked the grounding of the propositions. That is, he does not believe all propositions on face value. We have to observe that all propositions have been developed by discussing both theory and practice, which is in our opinion sufficient, because the protocol is one of many possible solutions. Real use in practice will demonstrate whether the assumptions in the proposition are valid. However, the critique has made us aware of the fact that several propositions could be stated more precisely and concretely, so that they become more convincing for the protocol users. We will review the propositions that are affected by this observation.

Design proposition 1: There is disbelief concerning the reduction of R&D costs and the increase of customer loyalty. Regarding the last mentioned benefit, he states that only the participating customers will be loyal to a certain level; non-participating ones will remain indecisive and indifferent. We have discussed the benefits from customer involvement earlier and have seen that extant research on the subject has demonstrated that customer loyalty is indeed increased when customers are involved. We have identified three main mechanisms for this outcome, i.e. the propensity of people to prefer something they have made themselves above what others have made (Franke & Schreier, 2006), the inclination to give credibility to WOM (Arnould et al., 2006; Price et al., 1995), and the positive relationship with the organization or brand that is triggered by involvement (Fournier, 1998). We therefore refute the comment. As for the reduction of R&D cost we observe that literature has also demonstrated this outcome that can be explained by mechanism of the User Active Paradigm (von Hippel, 1988). Heinz spent months at studying and researching consumers' complaints about how hard it is to get ketchup out of the bottom of the bottle and dried ketchup mess around the cap, before it was discovered that several consumers, including CEO William Johnsons' own wife, had

already found a way to cope with the problems by turning the bottle upside down; the upside-down ketchup bottle was created (see <http://www.mycustomer.com/item/134193>).

Another reviewer comments on design proposition #1 referring conditions that the R&D cost will decrease and innovation development speed will increase. He believes that this is true under certain conditions, for instance when the lack of customer input led to redesigns and inefficient allocation of resources to unimportant specifications. On the other hand the customer involvement also costs money and has to be optimized to ensure the positive final balance of the costs and added value. He would expect that the protocol also address the issue of finding this balance. We agree that finding the optimal mode of involvement requires an upfront deliberation of costs of involvement. This is incorporated in the premises and points of consideration for 3CI (see 10.4.3).

Design proposition 4: It looks as if in the present proposition the provision of tools suffices to engage potential participants. The proposition should indicate that customers will see and expect personal benefits in those situations where they receive power, influence, transparency, benevolence and honesty from the organization, which will motivate them to participate. The proposition has to be changed in that respect.

Design proposition 14: It is doubted whether customers can be more creative when they are volunteers, because customers tend to be functionally fixed. As has been discussed creativity is correlated with intrinsic motivation (Amabile, 1983). We therefore observe that the proposition is correct, but should be more specific, like "intrinsically motivated and voluntary participants tend to be more creative and contributing than when not motivated" as a mechanism.

In the design proposition #17 one reviewer is surprised with the very concrete minimal number of participants (15). He believes that this number highly depends on the industry and innovation domain. Indeed, we have to mitigate this proposition. In cases where the customer base is small or the innovation is customer specific (make-to-order industries) the number of 15 is not so absolute, and the company can involve just one or two customers. This is observed in the general guidelines of the protocol.

Design proposition 22: It is not believed on face value that all stages of the innovation process are suited for customer involvement. Again, we observe that in the development of this proposition we have reviewed extant literature examining this specific aspect of user or customer involvement. There is a general consensus that all stages can benefit from customer involvement, but that the type of contribution, customer role and interaction intensity can differ, for instance, the concept and product tester is typically a role for the latter stages, whereas the ideator or conceptor are roles that can be donned in the early stages. We have depicted this in Design Proposition # 24.

The design proposition #23 contains a clear recommendation, but it would be useful to be more specific on the detrimental effects to effectiveness of the process. Involving different sets of customers for each stage can also pose numerous challenges, especially in the areas, where recruitment of the customers is not trivial. The detrimental effects have been elaborated on when developing the proposition. We believe, however, that emphasizing these negative effects of involvement of the same customers will enhance the protocol.

In the design proposition #25 more detailed elaborations on the pros and cons of the online and offline approach and more detailed selection guidance would be useful. Again, we observe that the conditions that determine this mechanism (available time, amount or participants, available resources and openness) have been elaborated on in the development of the proposition. In the general guidelines we deliberate on them too.

In the design proposition #27 one reviewer does not understand the formulation "equal treatment". It will be useful to specify what the equal approach shall be applied to.

In the proposition #28 one reviewer is wondering whether the use of metaphoric language is advisable without a prior experience with it (or availability of an experienced facilitator). He fully agrees that the well applied metaphoric language can enhance creativity of people, but he has also experienced confusion caused by different interpretation of metaphors (esp. among participants from different cultures) as well as hesitation of certain people (especially those with a background in exact sciences) to engage in this form of communication. We believe that Design Proposition 16, which suggests training participants in the use of tools and techniques, covers this potential problem.

### **Protocol in general**

Alternative names that were suggested for the protocol were: CII (Customer Involvement in Innovation) Protocol and CInnov. Suggestions were made regarding the structure and the readability. Someone suggested introducing it by stating the stages for involvement, the type of customers to be involved, and the expected benefits. But, in general, the reviewers believed it to be robust and comprehensive. It was perceived as above expectations, because of its comprehensiveness.

Regarding the readability, communication style, overview and structure, several observations have been made by all reviewers. They are summarized as:

- Provide the reader with a roadmap to go along and make it easier to read.
- Provide diagrams or a decision tree that helps the reader as he goes along.
- Leave out the links to the propositions or the references.
- Include the parts of the dissertation that are necessary for the protocol – for example, where we refer to openness. If it is not necessary don't refer to it.
- Placement of figures, e.g. Figure 10-1: Distinction between the four routes on three dimensions would have been better placed earlier.
- Structure of the protocol – sub-section 10.4.4 could be better placed at the end of the whole protocol because a user would like to follow the protocol right through to get a better understanding of how to do the Customer Innovation. The other considerations can come later.
- The structure of the protocol is logical. Of course there are always ways how to make the navigation through the protocol easier. In this case you can think of (a) reducing redundancies and repetitions in the text (b) highlighting the decision making points and clearly introducing decision criteria and the alternative ways forward (c) by emphasizing key steps and recommendation and de-emphasizing their detailed underpinning.
- As mentioned above, the protocol will be very easy to access (enter) for the user if it interfaces to these initial user objectives and guides the user to clear and realistic expectations of added value from involving the customer. This can be achieved by promoting the content of the paragraph 10.4.5 to the description of the initiation of the process.



- The used style makes the protocol less accessible: long sentences, a lot of parenthesis and additions between brackets.
- Diagrams are difficult to read because of the small fonts. Their added value is also unclear. It is suggested to transform them into a mind map in which every line is elaborated on.
- Start every route with a short description as is done in 10.4.1, followed by its premises and point of considerations. An overview can thus be obtained as depicted in Table 10-3: Choosing the best route for .

One reviewer missed the “upfront homework” by business casing the innovation with market objectives like revenue, market share and financial ratios. This is a correct observation. We believe that it is not our task to prescribe how companies should prepare and execute their innovations, but intended this protocol to tell how to involve customers *in support of* the innovation initiatives.

One reviewer commented to the sub section 10.4.2 where the moment of initiation of the innovation project is characterized as “there is an idea about product or service category for which the innovation has to be reached”. His experience is that the fuzzy front-end of innovation usually works with themes or topics that are more specified in terms of areas of activities and needs than in terms of product and service categories, that emerge from the process at a later stage. He believes that involvement of customers (resp. future expected customers) in this very early stage is as valuable as in the later stages. We adapted the protocol in this sense.

It is also suggested to pay some attention and spend a few words on the drawbacks of customer involvement. We believe this to be a good idea.

Not all reviewers agreed on the suggestion to provide a reading list to support the protocol, because users do not need them to apply the protocol. If references are made, it is suggested to put them in footnotes instead of in the text. Users that are interested can look into such references. References are only needed to understand the protocol.

Finally, it was suggested to illustrate the several guidelines in the protocol with cases – these could convince when in doubt. As observed earlier, we believe this to be a good suggestion.

## **Protocol routes**

The four presented routes are recognized and acknowledged by the reviewers. One reviewer finds the protocol routes clear, comprehensive and useful not only for structuring the protocol, but also for challenging the companies to consider combining different ways of involving the customers in the overall innovation process. One reviewer thinks they emerge in a logical way from the design propositions, but that the user does not need to know the link to the design propositions. Below are some individual comments affecting the presentation of the routes.

One reviewer suggested enhancing the Dreamcatcher Route by giving attention to opportunity searching and thinking in solution spaces. Another one believes that the content of the “Create community ...” paragraph is not applicable in certain domains, which will require a different community building approach (e.g. seniors, nurses ... ). We suppose that the term “community” is confusing this reviewer, because one might think that we are referring to online communities. We emphasize that a community does not necessarily have to be online.

In the "Contest" route one reviewer does not believe the company has ever a real need to generate "substantially large amount of ideas". The objective is always to find right ideas, new angles of view, to understand value drivers, to get out of the stereotypical thinking. Although we agree with this comment, we also would like to observe that finding the right idea entails the generation of many ideas, even if the majority is useless. It is the acclaim of the Contest Route to collect a pile of ideas, in which the right idea is undisputedly situated.

Another remark was made regarding the distinction between the routes. They do not seem to be mutually exclusive. It is suggested to incorporate more contrast between the dreamcatcher and contest route. Contrast can be achieved by describing 'do and don't' conditions.

The 2x2 matrix for deciding which route to follow can be presented more elegantly as a 3-dimensional figure. We disagree on this viewpoint, since the combinations are not exactly 3-dimensional: the 'stages' versus 'openness' and the 'stages' versus 'completeness' dimensions both will result in four routes for each pair of dimensions, but the combination of 'openness' and 'completeness' leads to 2 possible pairs of routes. We will therefore leave the diagram unchanged.

The only dissonant route for one reviewer is the Employment Route, because it is not grounded in the design propositions. We observe however that Design Proposition # 9 (closed mode of involvement), Design Proposition # 25 (offline involvement) and Design Proposition # 27 (equal treatment of participants), typically indicate that by 'employing' the participant all conditions for an effective contribution are fulfilled.

One reviewer suggests renaming the Dreamcatcher Route by 'Imagination'. Another one suggested Customer Dreamcast. As the Contest Route, the suggested names were Popcorn (as the seeds of ideas come to explode) and Consumer Innovation Challenge. The only other suggested name for the Touchstone Route was User Validation. The alternative names for the Employment Route were Consumer Innovation Collaboration and On Board, as "employment" can be potentially misleading for some users. We will treat these suggestions for cognizance and refrain from changing the used names, since we intend to have unambiguous names.

Someone also suggested devoting some attention to team work aspects like group dynamics. This is not within the scope of our research, but could be overcome by giving some references regarding this aspect. Since it was observed that users probably will not be interested in references, we think we can suffice with mentioning that group dynamics also plays a part in the process.

Another suggestion was made about the Table 10-4 (Protocol – Phases, customer requirements, contributions, tools and techniques for involvement), where a distinction should be made between NPD and NSD activities. The table also mentions users as well as customers – this should be the one or the other. We support both of these suggestions and will incorporate them in the 3CI Protocol version 1.0.

### **Promotion of the protocol**

To promote the protocol several suggestions were made, such as the publishing of a 'stand alone' protocol, a commercial version of the dissertation, testing it to obtain best practices, communication through social media, introductory workshop, teaching courses at universities/college and certification of practitioners.

## 11.5 Implications of the review results for the protocol

### 11.5.1 Redefining the design propositions

The reviewers' comments have led to the redefining of some design propositions. The propositions which are affected are mentioned here along with the way they are affected. The overview in the 3CI-Protocol version 1.00 contains these changes.

Proposition 1: Because of the debate on whether or not R&D costs are decreased we changed this term in 'costs', omitting 'R&D'.

Design proposition 4: Because of the possible confusion in pointing out the exact relation between intervention, mechanism and outcome, the text of this proposition has been changed in such a way that it indicates that customers will see and expect personal benefits in those situations where they receive power, influence, transparency, benevolence and honesty from the organization, which will motivate them to participate. The new text of the proposition is: *In determining whether the firm is suited for 3CI in the context of its industry, market maturity and type (C4), any organization, regardless of the sector it operates in, the type of product it produces (goods, services) and type of market (B2B, B2C) can co-create with its customers in innovations (I4.1), provided that the participants are given sufficient influence, power along with the necessary tools to make contributions (I4.2) and the firm is authentic and transparent in its appeal (I4.3). Because contemporary users are motivated and inclined to exert control over firm's offerings (M4.1), perceive personal benefits when asked to participate (M4.2), and perceive the firm as trustworthy and credible (M4.3) when modern technological applications are in place and the firm is benevolent towards the customers. With these interventions customers are empowered to participate in 3CI effectively (O4).*

Design proposition 14: To prevent misinterpretation we suggested to state the design more specifically, like "intrinsically motivated and voluntary participants tend to be more creative and contributing than when not motivated" as a mechanism.

Design proposition #27 should specify what is meant by "equal treatment". We therefore changed that phrase of "equal treatment" in "treating them as team members".

### 11.5.2 Revision of the 3CI Protocol

The purpose of the validation has been to evaluate whether the designed 3CI Protocol serves its purpose, i.e. to guide organizations in involving customers in the innovation process in such a way that effective input is obtained from the customers that are involved. The general view was that the protocol is indeed capable of serving its purpose. But, nevertheless, several recommendations were made regarding the readability and presentation of the protocol. To increase its acceptance and use it would be wise to follow these suggestions in so far that they haven't been countered or declined in the discussion in the previous section. Following the useful suggestions led to an adaptation of the protocol, which we will refer to as the 3CI Protocol version 1.0. This revised version is presented in at the end of this thesis before the References. The reason for presenting the revised protocol in an appendix is to make it enable its detachment or uncoupling from this thesis. Users do not have to obtain and study the complete thesis to make use of it. Instead, it can be obtained as a stand alone document for all the managers interested in using it. In this section we will present how we adapted the protocol, based on the suggestions, comments and remarks made by the reviewers.

The protocol version 0 contained references to the appropriate design propositions in the text. To be able to follow the guidelines it would require a reader to thumb forth and back in the protocol to interpret the design propositions. To prevent this forth and back

thumbing we have replaced all direct references to a design proposition with a textual summary of the proposition's content, making it possible to immediately understand the guideline. Reference to the proposition is still made between brackets. We have decided to maintain the propositions as a part of the protocol, but to change their location in the protocol. They are now located at the end of the protocol as a reference. They are introduced with an explanation of the CIMO logic.

Regarding the comment of aiming at a broader participation than customers and end users alone we have already observed that although this is possible, we want to confine this protocol to end user involvement for some practical reasons. However, the introduction to the protocol has been adapted in the sense that application might be broader than presently presented.

As to emphasizing the disadvantages and risks of customer involvement we have added a few sentences in the first general guidelines, referring to these risks and how to cope with them. Along with them we have emphasized the detrimental effects of involving the same customers during the process.

It was suggested to revise the Premises for 3CI (sub section 10.4.2.) in respect of the initiation of an innovation project in themes or topics that are more specified in terms of areas of activities and needs than in terms of product and service categories that emerge from the process at a later stage. Such an adaption has been made in the relevant part.

Since not all reviewers perceived the advantage of a reading list to support the protocol, we limited the references to the minimum and mentioned them as footnotes, so they do not interfere with the text and reducing the readability. Users that are interested can look into such references. Regarding the improvement of the protocol readability and structure we have also made the following adjustments:

- The structure of the protocol has been changed in the following way.
  - An Introduction telling the aim and use of the protocol has been included.
  - A list of some important definitions of terms used in the protocol has been included.
  - Then the "premises for involvement" are discussed, listing the conditions that have to be fulfilled before considering customer involvement.
  - Next, the four routes are briefly described.
  - This brief description of the routes is followed by the "Points of consideration" to assist the user in choosing the appropriate route. The 2x2 diagram and the table are included at the end of this discussion.
  - Some specific aspects regarding 3CI and the way to make the decisions are discussed next.
  - Next, we elaborate on the general guidelines, followed by the route guidelines.
  - The protocol is summarized with the 'do's and don'ts'
  - The design propositions with an explanation of CIMO are placed at the end.
  - The intake questionnaire, the workshop program and the quick scan are attached as appendices to the protocol

- An overview roadmap for the reader is inserted in the Introduction.
- The links to the propositions or the references have been left out.
- Where appropriate the parts of the dissertation that are necessary for the protocol were included.

The suggestion to support acceptance of users by illustrating and exemplifying the guidelines with case descriptions is acknowledged. In this respect the guidelines have also been augmented with short case descriptions to support the assertions made in that guideline. For instance, on the assertion that a tsunami of contributions can take place, this was illustrated by the IBM Innovation Jam case.

The refutation of the assertion that the protocol is suitable for all kinds of innovations (product vs. service, radical vs. incremental, open vs. closed mode) we have already observed that this has been elaborated on in developing the design proposition, thus obtaining some corresponding and innovation type specific design propositions, such as Design Propositions 4, 8, 9, 10, 12, 13. We therefore conclude that the protocol has sufficiently covered this issue. However, it would prevent future comments if this was emphasized in the protocol. This has been accomplished by inserting a paragraph dedicated to this assertion.

It has also been suggested to pay some attention and spend a few words on the drawbacks of customer involvement. In the introduction this has been taken care of.

### **Protocol routes**

The Dreamcatcher Route has been enhanced by giving attention to opportunity searching and thinking in solution spaces.

The distinction between the routes has been emphasized in the route descriptions.

Another suggestion was to make a distinction between tools for NPD and NSD in Table 10-4 (Protocol – Phases, customer requirements, contributions, tools and techniques for involvement). The new table has been enhanced in this respect.

Regarding the comment that the "Create a community"-paragraph of the Dreamcatcher Route does not apply to certain (offline) communities, we have added a sentence that states that the same principles apply to offline communities.

## **11.6 Conclusion to this chapter**

The protocol has been validated in two stages: (1) Co-creating of the design proposition with 8 potential users; (2) following this, the adapted propositions, along with the requirements and the protocol design were presented to a set of reviewers – of which 7 commented – consisting of (potential) users, experts, consultants, and academics, leading to comments on its usability for its purpose. For this last phase a Delphi was planned in case those opinions regarding the usability were very diverging. The first stage confirmed the design proposition in a high extent. The only content disagreement was about the applicability of the protocol in all sectors, which is disputed by some reviewers. We have countered with our research findings, but nevertheless, practice needs to confirm this proposition. Comments from the second stage reviewers also confirmed the usability, comprehensiveness and robustness of the protocol and concerned only the readability and user friendliness of the protocol. In this respect several suggestions for improvement were provided. Based on this review we have

concluded that there is consensus regarding the usability and have therefore left out the Delphi inquiry to reach the consensus. The protocol has been adapted in the sense that reviewers had a valid point. The thus adapted protocol is presented as version 1.0 at the end of this thesis<sup>0</sup>. We can now proceed with a discussion on the research approach and findings in respect of its contribution to management science.

# Chapter 12 Conclusions and recommendations.

## 12.1 Introduction

In this last chapter we will place our research in perspectives. Questions such as whether the design is generalizable as it is asserted, whether we have contributed to new theory and whether the design approach can be perceived as management research will be discussed and answered in this chapter. We close the chapter with some suggestions for further research.

## 12.2 Discussion

### ***12.2.1 Design Science Research to generate practical management knowledge***

In this thesis we have used the Design Science Research principles to develop a practical solution for an existing and still emerging managerial problem, i.e. the question on how to involve customers in innovation processes. By making use of extant research results as well as practical knowledge on the subject and synthesizing them we have been able to develop a total of 28 design propositions in the area of the context conditions for customer involvement, the requirements regarding the participating customer and the process of involvement. Combination of certain propositions has led to the identification of four main approaches, called routes, to involve customers in the innovation process. The outcomes of the design process we have applied were depicted in a 3CI Protocol, which managers can consult when aiming at such an involvement of customers for some reason.

The reasons for the use of the design science have been elaborated on, finding that most management research is descriptive of nature whereas the need exists for prescriptive research. Design Science Research has proven to be a research approach that enables us to create and design solutions to managerial and organizational problems, that otherwise have to be solved by managers and practitioners in the field. Although Design Science Research thus provides us instruments to deal with practical field problems (den Hertog et al., 2010; Romme, 2003; van Aken, 2004;2007), it is not widely acknowledged yet by the academic body, and sometimes even doubted (Pandza & Thorpe, 2010). This research therefore might be received with the same kind of skepticism by other scholars, influencing practitioners negatively, leaving us with a bitter taste because there is no use for the result of our efforts. Nevertheless, we believe that our reasoning and arguing, that have led to the design propositions, and finally to the design of the 3CI Protocol, are based on ample study and grounded synthesis of rigorous research as well as evidence based practice, and that they provide a solution that has been acknowledged and confirmed for its practical relevance through peer review.

### ***12.2.2 Discussion on validity of the design***

The previous discussion and its conclusion may raise another question. If the design of a solution is based on thorough research, particularly non-academic research, does that make it a valid design? One answer to that question is that the validity depends on the frequency of citations in other research. Miner (1984) analyzed 32 established organizational science theories in terms of their rated importance, validity, and usefulness. He found that there is no evidence of any relationship between the frequency of nomination in other research and its estimated scientific validity; thus, the goodness (validity) has nothing to do with the forming of consensus regarding its importance at

this time in this field. There is also no evidence of any relationship between the frequency of nomination and estimated usefulness. As is observed by Ellson:

"The value of any writing must be the ability to communicate thoughts and understanding. The impact of those understanding is a matter of degree and may shape future action, attitude, belief, emotion, knowledge, sentiment, thought, or perhaps a combination of these and other components. Outcomes may include action and improvement, anger and dismissal, argument and discussion, shame and disgust, thought and creativity. A citation system does not necessarily delineate the respective contributions of the researcher, scholar and intellectual unless popular acclaim is a measure of value. (...) Only a more holistic recognition of impact, influence and usefulness can accurately evaluate the impact of journals and an author's contribution and scholars should not relegate business research as a living discipline to philosophical insignificance by simplistic measurements of scholarly and intellectual prowess." (Ellson, 2009:1160).

We believe therefore that the design should be judged and valued by its usefulness for practice. If adoption by managers that intend to use it proves to be high or substantial, and it is used repeatedly by the same managers, we believe to have produced a valid solution for a practical problem.

### ***12.2.3 Discussion on generalizability***

Our design also faces the problem of generalizability of the results. This problem of generalizability is of course by no means a problem that concerns this research method only, but is a problem that all research methods face. However, as the design science research method aims at producing practically applicable knowledge, the problem of generalizability becomes an issue of greater concern. The problem of generalizability means that practically applicable knowledge should be developed and applied with care. The concept of analytic generalization seems appropriate here, i.e. to develop theoretical propositions but not to enumerate frequencies (Yin, 2003). In this way design science research can provide knowledge that does have a general interest because other actors can learn from these design results and because the design propositions provide indications of how certain actions will influence certain outcomes even though procedures cannot be applied blindly but must be adapted to specific companies' particular contexts. The key here is the mental abstraction of underlying variables (Sørensen et al., 2010), which we have depicted in generic interventions, mechanisms and outcomes in the design propositions.

### ***12.2.4 Contribution to new theory***

Pertaining to the ambition to contribute to the development of new theory, we observe that since the start of this research many new studies and literature on the subject of customer or user involvement, co-creation, crowdsourcing, etcetera, have emerged and have been published. In many cases these studies acted as a support of our own design propositions. Conversely, none seem to contradict the findings of our research, except for discussions about the expected expertise of the participating customers; some research support the idea of lead users being the best source for innovating purposes, while other research do not discriminate in that matter.

However, none of these new publications covered the subject as comprehensive as in our case. Nor did we find any research yet that offers or finds practical and effective solutions for the problem of decreasing interest with customers as the innovation process proceeds; we have proposed to change participants with change of activities. And, there is little attention for the involvement of customers in the commercialization stage of innovations in extant literature; we have proposed ways for organizations to effectively involve customers in this stage as well as other stages of the innovation process.



In addition, many studies are strictly of a descriptive nature and lacking in explaining why customer involvement is working in the cases of success or why it failed in some other cases. In this respect we had to explore literature in disciplines as psychology, social psychology, sociology and communication theory, mainly for off-topic subjects, i.e. not relating to the customer-company interaction at all, to explain several mechanisms in our design propositions. Although many of these mechanisms are assumptions that have to be validated on why an intervention generates a certain outcome and may not be the only ones explaining the outcome, we believe that this research has provided a valuable contribution to theory. It gives direction to further research to explore the assumptions underlying the mechanisms of our design propositions.

### ***12.2.5 Limitations of this research***

Although we believe to have produced a comprehensive, general applicable protocol for customer co-creation in innovations, we also have to be aware of its limitations.

First, customer co-creation is not a panacea for innovation problems in organizations. We have to be aware of the fact that innovations and their successes depend on many other factors. This awareness and the findings that customer co-creation can but does not necessarily lead to benefits for organizations is the best reflection that managers can make in this respect. It may also be that customer involvement isn't a trend at all and will show to be but only a hype. Companies have always been eager to take on board the views of their market. Customer involvement or co-creation is all very well but has its limits. Part of the issue is how to make it sustainable, instead of a series of one-off projects. As a new business model, product-based dialogue will probably never replace the continuous input provided by traditional, ongoing customer and market research. But when thinking of oneself as a consumer and user of products and services during lifetime, managers may become aware that their experience of using a product builds up over time and, therefore, whatever issues arise are going to come up in their time period, not the company's time period. Despite the hype that surrounds customer co-creation, we may see it as an extension of what marketers and researchers have been doing for companies for years. And if it is something new, there is something old in it too. 100 years or more ago, businesses spoke to their customers because they lived in the same places. Mass production and mass advertising changed that. Only now are technologies enabling the kind of conversation that used to happen regularly, except that it is global and not local. That is the difference, and that's why it might be considered a trend and not a hype.

Second, our premises were that managers should voluntarily use the 3CI Protocol. It is not a prescription or a remedy for organizations to become customer oriented. Becoming customer oriented takes more than the simple application of this 3CI protocol. One could oppose that organizations that voluntarily use this protocol are already customer oriented and would not need this protocol. And if there are no volunteers, there is also no need for a protocol, rendering our whole research useless. We counter by observing that although management is or has the intention to be customer oriented, this doesn't imply that this management also is adequately equipped with the knowledge on how to effectively and efficiently involve customers in the innovation process. Voluntarism also acknowledges that there is a discrepancy between the status quo and the intended state of customer orientation and that this protocol provides a means to close that gap in certain, but not complete way. So, a warning is timely and justified.

Thirdly, although the 'one size fits all' approach is propagated, we have to be aware in a certain way of the uniqueness of every problem and take specific conditions the firm is in into consideration. Specific conditions could be the type of offering – experiences are better innovated with co-creation of customers than commodities, the customers' knowledge – developing a lunar module requires other expertise from customers than the

development of a car, and so on. In this research we have simplified our problem by stating that on aggregate level, all these situations are similar, and subsequently by designing a protocol that addresses the aggregated problem. Further research could investigate individual or specific situations and the ways to customize the protocol to deal with each unique situation.

Fourth, the researcher's preferences are reflected in the design and should raise the question whether the design is complete in the broadest sense. Other solutions are still possible for the problem we have tried to solve. Ideally, the designer should be neutral to the problem to be solved, i.e. it should not be the designer's problem, for this will permit bias to play a role in the solution. For such an approach to work, however, there needs to be a clear and stable boundary between the entity being designed and the context for which it is being designed. Such a boundary makes it possible to fix the purpose of a design based on a stable set of user preferences and performance expectations (Garud et al., 2008). But how does such an approach to design hold users of a design that are also its designers, i.e. inviting them to co-create it? This is the new frontier in which we find ourselves. There is no clear separation between the inside and the outside, text and context. Rather, there is only an evolving and emerging network of associations (Barry & Rerup, 2006). Problems are ill-defined, preferences are fluid and solutions emerge in action. In such situations, an emphasis on completeness and unbiased designs is likely to result in the creation of designs that foreclose future options.

"(...)designs are like dynamic jigsaw puzzles in which multiple actors assemble pieces within templates that change as a result of the actors' engagement (Garud et al., 2008:352)".

The traditional scientific approach employed principles from the natural world to design an artifact with enduring qualities that fulfilled a specific purpose in an unchanging world (Garud et al., 2008). From this perspective, a design was fixed in time and space; it was opened and modified only to accommodate exogenous environmental changes. Moreover, the locus of a design, i.e. the demarcation between designer and user, was clear and unambiguous. In contemporary environments, however, the distinction between designers and users has blurred, resulting in the formation of a community of co-designers who inscribe their own contexts into the emergent design, thereby extending it on an ongoing basis in diverse and non-obvious ways. Such generative engagement by multiple co-designers is facilitated by numerous socio-technical mechanisms. Tools such as the wiki, licenses such as the GPL, forums such as bulletin boards and the infrastructure provided by the internet, work with one another to facilitate participation and enable distributed development. This dynamic action net (Czarniawska, 2004), then, contributes to the design remaining in a fluid state (Garud et al., 2008). Coincidentally, this co-creation and co-designing with many users has been the subject of this whole research, demonstrating that it is not that odd at all.

The Linux and Wikipedia cases described by Garud et al. (Garud et al., 2008) demonstrate that incompleteness acts as a trigger for generative engagement by co-designers. They are the ones who complete what they perceive is incomplete. They discover the purpose of a design in use. They create avenues for future development that, in turn, attract new groups of co-designers. From a pragmatic design approach, what was considered to be an interruption then now becomes the basis for ongoing change. In that respect, although we might establish that the 3CI Protocol is incomplete, similar to Wikipedia and Linux it might act as a trigger for further development, leading to more and greater insights that will help organizations to properly tap into their customers' potential and willingness to participate in the value creation processes of the organization.

## 12.3 Suggestions for future research

Finally, we would like to suggest some paths for future research. We have validated – or, tried to validate – the protocol through peer review. We have observed that this is not the ideal validation in the design science research methodology. To make proper conclusions about the validity in practice, it is needed to test the protocol in practice situations. So, a first opportunity for further research is reflected in the practical validation of the protocol by applying it in real life situations. Research could focus itself on the collection of the cases where the 3CI Protocol is applied and their outcomes, and to try explaining or justifying these outcomes with this research as a basis. Future research could also focus on explaining specific conditions that require adapted application of the protocol or even adaptation, augmentation or expansion of the design propositions. Both types of future research could be aimed at the further development of the design in order to fit many possible situations and conditions.

But, future research could also be directed at investigating the underlying generative mechanisms of our design propositions. Although we have tried to review and study extant literature thoroughly to identify these mechanisms, we have to be aware that in many cases we had to make creative assumptions about these mechanisms. This could mean that further research is needed to either justify these assumptions or identify the true mechanisms that generate the intended outcomes when certain interventions are applied.

One particular research line for the future could focus on the propositions that are aimed at configuring the interaction process between participating customers and the firm. We realize that stating that the company should use metaphor language and integrate the participating customer in its NPD-team is, although it is substantiated with theoretical evidence, easier said than done. Metaphors are not easy to interpret and they are so embedded in language that they usually go unnoticed by laymen. However, there is ample research on the subject of linguistics, pragmatics, cultural habits, and such, that a great opportunity arises to further investigate this proposition for its practical implications. One specific subject of research could be to investigate to what extent the ZMET™ method can be adapted to give participants the possibility to generate ideas and solutions to innovation challenges<sup>31</sup> which go beyond the mere articulation of their needs and wants through metaphors (Olson et al., 2008). Similarly, literature on composition, management, dynamics, and appraisal of NPD-teams and cross-functional teams can be a great starting point to determine the integration of the customer in the team more precisely than described in this thesis. We particularly recommend looking into virtual team literature as well, because the geographically dispersed customer would probably prove to be the ones the firm wants to co-create with. In that respect, attention can be given to the emergence of social media platforms like Facebook, MySpace, and LinkedIn to operate on.

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<sup>31</sup> As indicated in a newsletter article (Weber, 2009b).

## Appendix A. Glossary

### ***Closed mode of customer co-creation***

Closed mode of involvement stands for innovation with a minimal set of external partners – they are like private clubs, e.g. collaboration between a specific supplier and one of its customers to realize a customized innovation. The closed mode is usually followed in the implementation stage of the innovation process, when the available resources (number of concepts, prototypes, beta test units) are limited, or the available places as a NPD team member are limited. The closed mode typically uses the physical (offline) interaction mode.

### ***Crowdsourcing***

Crowdsourcing is closely related to customer co-creation in innovations since it also involves non-professionals performing some tasks for firms. These non-professionals are referred to as a crowd, since crowdsourcing stands for outsourcing to the crowd.

### ***Customer***

Customer is the term to designate individuals or organizations that (will potentially) transact with the firm to obtain a product or service for their own use or further use by others. This means that the whole collection of existing and potential customers, existing and potential users are incorporated in this meaning.

### ***Customer co-creation***

The term co-creation refers to creativity where more than one person is involved, resulting in a product that something none of the creators could or would have achieved working alone. Co-creation does not necessarily imply the involvement of customers – the creation of a new product by two different firms is also co-creation. We will therefore avoid the use of the term co-creation, and will designate it more specifically by *customer co-creation*. Customer co-creation is the collaboration between firms and customers to create value together, rather than by the firm alone.

### ***Customer co-creation in innovations***

*Customer co-creation in innovations* is the phenomenon where companies engage in *interaction* with customers and actively involve customers in the innovation process to jointly perform innovation activities and co-create value. Active refers to the voluntary and conscious participation of the customer in innovation, in contrast with traditional market research or needs assessment where customers are passive and usually ignorant of their participation in innovation. So, it is the process where product manufacturers and/or service providers engage with their end users or customers in (parts or phases of) innovation projects with the aim of increasing effectiveness and efficiency of the innovation process. Effectiveness refers to (1) the result of meeting users' and customers' needs and demands in a better way; and (2) increasing customer loyalty. Efficiency refers to (1) the reduction of research and development costs; and (2) the reduction of development time.

### ***Customer involvement in innovations***

Customer involvement in innovations refers to the general, whether active or passive, participation of customers in innovations. The active form is what we refer to as co-creation, where customers are fully aware of their participations, its purpose and consent in participation. The passive form occurs when people are submitted to market research,

surveys, product/service testing, and such, without their conscious knowing that this submission serves a specific innovation.

### ***Customer Knowledge Management (CKM)***

Refers to managing the most precious resource: the knowledge *of*, i.e. residing in their customers, as opposed to knowledge *about* their customers. Practice-based view to knowledge suggests that customer knowledge is constructed in social interaction and negotiation between people inside and outside of a company. Customer knowledge does not entail facts; rather it consists of interpretations of various people and is always open to negotiation and dispute. By managing the knowledge of their customers, companies are more likely to sense emerging market opportunities before their competitors, to constructively challenge the established wisdom of 'doing things around here', and to more rapidly create economic value for the corporation, its shareholders, and last, but not least, its customers.

### ***Customer orientation***

Customer orientation is defined as the sufficient understanding of one's target buyers to be able to create superior value for them.

### ***Experience***

*Experiences* emerge when products and services are commoditized. An experience uses a good as a prop and services as the stage for engaging the customer in such a way that it creates a memorable event. Experiences are thus regarded as non-technological innovations of products and services, which increase the perceived value for customers.

### ***Incremental innovation***

Incremental innovations are small improvements in existing products and operations that let them operate more efficiently and deliver ever greater value to customers.

### ***Innovation***

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

### ***Innovation process model/stages***

We will use a simplified process approach that consists of four main phases. The first (Conception) of the three phases in the chain is to conceive the innovation by generating and selecting ideas; this can happen inside a unit, across units in a company, or outside the firm. The second phase (Implementation) is to convert ideas, or, more specifically, developing them into products or practices. The third (Marketing) is to diffuse those products and practices. The fourth phase is called Re-innovation, a phase distinguished and followed during the use of the initial or primary innovation, where product performance is improved during interaction with users (Gardiner & Rothwell, 1985; Shaw, 1985). In this phase we can distinguish activities like customer training, customer service, warranty and complaints handling, and maintenance or replenishment. An interesting aspect of this scheme is the suggestion that the innovation does not cease at market launch, but rather continues via a process of evolutionary development, refinements and improvements during the use of the innovation.

### ***Lead user***

Lead users are users who present strong needs that will become general in a marketplace months or years in the future. Since lead users are familiar with conditions which lie in

the future for most others, they can serve as a need-forecasting laboratory for marketing research. Moreover, since lead users often attempt to fill the need they experience, they can provide new product concept and design data as well.

### ***Market orientation***

Market philosophy or orientation is an implementation of the marketing concept (requiring that customer satisfaction rather than profit maximization be the goal of an organization), that entails learning about customer needs, the influence of technology, competition, and other environmental forces, and acting on that knowledge in order to become competitive. It is suggested that the market orientation of an organization involves three behavioral components (customer orientation, competitor orientation and inter-functional coordination), and two decision criteria – long term focus and profitability.

### ***Market research***

The systematically executed activity of discovering what people in product and services markets want, need, believe, or even how they act is called market research.

### ***Open innovation***

Open innovation is a new paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firm look to advance their technology.

### ***Open mode of co-creation***

In totally open collaboration, which reaches its extreme with crowdsourcing, everyone (suppliers, customers, designers, research institutions, inventors, students, hobbyists, and even competitors) can participate. This mode of co-creation can best be followed in the conception stage (ideation, problem solving) and re-innovation stage (improvement suggestions, complaints, new ideas, problem solving) where many ideas are welcome. Because of the many participants the best channel for interaction is the online channel.

### ***Radical innovation***

Radical or discontinuous innovations are radical advances like digital photography that profoundly alter the basis for competition in an industry, often rendering old products or ways of working obsolete.

### ***User***

User is the person or organization that uses the product or service for their own benefit.

### ***User innovation***

We refer to user innovation as innovations developed by customers and end users for their own benefit, rather than manufacturers.

# Appendix B. Expert Interview Questionnaire

## Expert Interview

Interview Protocol PhD Research Marcel Weber

### Introduction and background

*State own name, background and experience.*

Ambition: doctoring on the subject of User and Customer co-creation in innovations by designing and testing a protocol for firms in which they can find guidelines on (see Research Proposal):

- Reasons for involving customers in the innovation process
- Phases or moments where it is timely to involve customers
- The kind of customers to involve, i.e. requirements product knowledge, product usage, capabilities, etc.
- Tools, methods and procedures to be exerted.

### Objectives of this interview.

*Explain interview objectives*

Expert interviews are executed to obtain whatever knowledge there already exists on involving customers in the firm's innovation process and initiatives. Experts will consist of scholars in the field of customer generated innovations, practitioners in the field and managers of companies that have experience in innovating with customers.

The interviews will consist of the following elements (agenda):

- Relevance of the interviewed expert in customer generated innovations;
- Experience in time, academic contribution and cases of interviewed expert;
- Summarizing, naming and briefly describing the cases or projects for which the qualification customer-generated innovation is applicable, relevant, and a brief evaluation of their successes;
- Analysis of the most successful and the least successful projects or cases done by the interviewed expert with the use of the CIT, Critical Incident Technique to collect relevant aspects, factors and conditions for the success or failure of the projects.

Interviews will be executed by email, chat or a personal visit, depending not only on technical facilities, interviewee preferences and distances, but also on the contribution, expected from this person. The number of experts to be interviewed depends on the degree to which an incremental interview brings new insights (a matter of saturation), but it is anticipated that 12 to 14 interviews must be executed.

*If possible and feasible interviewees can supply documents that address the interview objectives and elements.*

*Personal interviews will be audio recorded: get permission.*

### Company background and data

*Please supply some information and data about the company, like:*

- Mission
- Products
- Customers
- Global reach
- Revenues
- Age, size
- Etc.

### **Expert description, experience**

*Summarize expert's background and experience:*

- personal data, like age, education
- experience before coming to work for the company
- career within company, present position
- relevance on research subject, i.e. in involving users and customers in innovations
- education and training received for this specific part of the job, experience

### **Company's experience, reasons, cases**

*Please describe and elaborate:*

- Vision: why the company is involving users and customers in innovations
- To what extent: are there norms or standards for this involvement, like a percentage of projects, number of customers to participate, product categories, exclusions, limitations, and such; why?
- Examples from the past 5 years, can these be given
- Successes and failures with this customer involvement: please specify.

### **Success an failure analysis: CIT**

*Name the most successful project and the greatest failure experienced by expert.*

*Per case, describe:*

- What it was about, why was the project started?
- Was customer involvement intended or not? Why?
- In what phases of the project were they involved? Why?
- What kinds of customers were involved? Why?
- How were they involved, i.e. tools and techniques used?
- What went well, what went wrong? Why was it a success, why a failure?
- Analysis: what are the expert's reasons for project success or failure?
- Lessons learned: applicability of findings in other projects

### **Closing**

*Did we forget anything, did I overlook important matters?*



*Permission for using data?*

*Any other suggestions?*

Thank you very much

## Appendix C. Tools highly suited to support involvement

Nr	Tool	Idea phase	Concept phase	Development phase	Test phase	Commercialization phase
1	Customer interview	2	2		1	
2	HIT	1	2			
3	OBR	1	2			
4	ZMET™	1	2			
5	Protocol analysis			2	1	
6	Scenario analysis		2	2		
7	Concept test		1			
8	Alpha test				1	
9	Beta test				1	
10	Empathic design					
11	Diaries/web log	2				
12	Toolkit for design					
13	Toolkit for innovation					
14	Brainstorming	2				
15	WAI	1				
16	Focus group		2			
17	Information Pump (IP)					
18	Synetics	2				
19	STOC					
20	Listening in		2			
21	AVAIN	2				
22	Nominal Group Technique (NGT)					
23	Problem Inventory Analysis (PIA)	2				
24	Future centre					
25	Customer Idealized Design (CID)		2			
26	RAD			1		
27	Virtual Customer Community (VCC)					
28	Beta VCC					
29	Modding (VCC)					

Based on van Daelen (van Daelen, 2005).

## Appendix D. Cases of user or customer co-creation in innovations

Six cases are elaborately discussed in Chapter 5. These are not the only cases we have built this 3CI-protocol on. There is more! In this appendix we sum up several cases of customer co-creation in innovations, new product or new service development, found in literature and magazines. We confine ourselves in the case descriptions by merely giving the case a name, a short description of the idea of involvement in 1 to 3 sentences, and the sources from which the case was extracted, when this was the case. The cases are listed in an alphabetical order.

But, before we start, we also want to emphasize that not all initiatives from practice are successes. LEGO in the US did run a 'design a model' competition in 2007 and the winning model was sold online, earning the victor a 5 percent royalty, but the experiment has not been repeated. Similarly, customer-created advertising, purported to be another triumphal aspect of the customer-made phenomenon, has not lived up to initial expectations. The do-it-yourself ad campaigns run by Firefox, Mastercard, Jet Blue and McDonald's have all proved one-offs. Some of them had limited customer input in the first place: the McDonald's ads simply had customers in them. Also neglected by advocates of customer-creations are the ads that backfired, as happened with Chevrolet in 2007. Environmentalists used the opportunity to make satirical attacks on the product and then released them on YouTube in their hundreds (source: Trendwatching.com).

### **10TouchPoints**

Already a haven for clean design, city-state Singapore's Design Singapore Council's "10 TouchPoints Program" (<http://www.10touchpoints.com.sg>) is asking Singaporeans what should be 'better designed' on their island. It is a voice box for opinions of users to be heard as they vote for what can be better designed. For designers, it is a challenge to produce the best redesign solutions for implementation, while getting the chance to win attractive prizes and bringing their share to better living. For service providers, it is a platform to tap into users' insights and using the best design solutions to remake and enhance existing items and services for the people.

Source: Trendwatching.com.

### **3M Telecom Systems**

3M's Telecom Systems Division holds a cafeteria fair at customer sites to see how that site is using 3M products and to expose customers to products they may not be using. 3M finds the insights useful in approaching other sites and customers and in helping customers learn about the range of its products and services. It also helps 3M understand how different sites (regions, countries) of the same business customer vary in their levels of satisfaction with the same product. Source: Davenport et al., 2006.

### **3VOOR12**

By applying the principle of Film It Yourself (FIY) 3VOOR12, an initiative from VPRO (a Dutch broadcaster) collected over 200 footages made by the audience from Pinkpop, a popular concert around Whit Sunday. From these footages a complete registration from the concert was made. 3VOOR12 makes recordings for other concerts as well. Source: Emerce (June 3, 2009)

## **Amazon**

Needless to say, it was Amazon.com who pioneered this kind of customer involved service, with their sophisticated recommendation system and customer book reviews, resulting in some of the most popular features of the Amazon.com site being entirely customer made. Source: Trendwatching.com

## **Apple**

A generation ago (late 1970s/early1980s), Apple Computer harnessed the power of its user community to design extensions for the Apple II. It published detailed specifications for the software and hardware interfaces, and had active "developer" programs that provided technical, financial, and marketing support. The result was hundreds of thousands of third-party software products and plug-in cards that addressed a variety of applications. It also resulted in greatly increased Apple II sales, since customers knew that whatever they might want to do with their computer, there probably were third-party products available to help them do it.

## **Banking**

New service development (NSD) is an imperative to suppliers in today's highly competitive banking markets. Communication during the NSD process is important if the needs of customers are to be met functionally as well as economically. The results presented in this paper identify communication skills associated with successful NSD. Case research into nine UK-based commercial banks shows that the most successful developers use special skills for communicating with customers – especially with "lead customers" – throughout the development process. Less successful developers concentrate their communication exchange on the end of the process. Source: Athanassopoulou and John, 2004.

## **Battle of Concepts**

Battle of Concepts is a Dutch intermediary platform for companies to place challenges, called 'battles', to be solved by the BoC-community. The community consists of students and young graduates who want to get in touch with the business world. From all submitted ideas the company that places the battle selects the most promising one(s) and obtains all IP-rights. Winning participants acquire credits that accumulate. Source: [www.battleofconcepts.com](http://www.battleofconcepts.com); Emerce (August, 2007).

## **Boeing 777**

In developing Boeing's jetliner, the 777, the company has made its airline customers full partners in the design-build process. Design-build teams also include suppliers and various disciplines within the company, such as finance, operations, engineering design, manufacturing, and customer support. While there are enormous benefits to this teaming strategy, the process of building effective teams is difficult. Source: Condit, 1994.

## **Boeing 787 Dreamliner**

Boeing involved over 150,000 people around the world in its World Design Team to develop the Boeing 787 Dreamliner. The Design Team is an internet-based global forum that encourages participation and feedback while the company is developing its new airplane. Activities include message boards, conversations with the Boeing design team, and extensive discussions on what members like and don't like about air travel today, as well as features they'd like to see in their dream airplane. Source: Trendwatching.com.



**Figure 12-1: Boeing 787 Dreamliner (source: Boeing)**

### **British Aerospace Tooling and Equipment**

User-initiated innovation is a significant source of new industrial products in certain industries. Recent investigations have been concerned primarily with the identification of user-innovators and their usefulness to the manufacturers who eventually make and/or market the new product or process generally. The extension of thought to include the activities of customers in the initiation of the industrial innovative process has been based upon the assumption that the firm which initiates the user-based innovation will play no more than a small role in its commercial exploitation. This article presents a case study of a company, British Aerospace, which has deliberately attempted to exploit commercially some of the innovations developed internally for its own use. The article goes on to suggest an extension to the "customer-active paradigm" of innovation research to include such pro-active behavior. Source: Foxall and Tierney, 1984.

### **Brucker Land**

The case of Brucker Land ([www.bruckerland.info](http://www.bruckerland.info)) is an example of an innovation process that was developed and implemented by citizens alone without any government intervention. This organization was established in 1994 by citizens who shared the impression that the ever-more industrialized and globalized system for the production and distribution of agricultural products is partly responsible for the deterioration of certain economic, social, and ecological parameters in their county and beyond. Applying a reciprocal logic, they were convinced that a strategy "From the County, For the County" would cure or at least mitigate those ills. In order to put this slogan into action, they created a strategic alliance of farmers, food producers – mostly bakers and butchers – environmentalists, church representatives, and consumers. Together they founded the "Brucker Land Ltd." This entity serves as a broker between the farmers, food producers, and consumers of Fürstentfeldbruck County. It provides a set of legally binding production and processing criteria and controls their compliance. Products that meet these criteria receive the legally protected Brucker Land logo and are sold in most food retail stores and almost all supermarkets in Fürstentfeldbruck County. Source: Brand, 2005.

## **CAD systems**

A study integrated market research within the lead user methodology and reported a test of it in the rapidly changing field of computer-aided design (CAD) systems for the design for printed circuit (PC) boards. The test successfully identified lead users and found that such people have unique and useful data regarding new product needs and solutions for those needs. The study found that new product concepts generated on the basis of lead user data were strongly preferred by a representative sample of PC-CAD users. The evidence provided by this study appears to represent a reasonable basis for a prior hypothesis that lead user analysis can improve the productivity of new product development in rapidly evolving fields. Source: Urban and von Hippel, 1988.

## **Cafepress**

At Cafepress ([www.cafepress.com](http://www.cafepress.com)) community members can create and sell products (t-shirts, gifts) with their own designs at a marketplace, in a similar way as Spreadshirt. Another option is to become an affiliate, in other words, to add a link to one's own web sites. Source: Antikainen et al., 2006.

## **Chevrolet Aveo**

To promote the Aveo among students, Chevrolet launched the Chevy Aveo Livin' Large Campus Challenge in 2006. For this contest 7 student couples were selected to live in the Aveo for a week. Participants posted their experiences in blogs, videos on YouTube and mobilized their friends and their friends on Facebook and MySpace, making the Aveo gain popularity with students. Source: MarketingMax, 2008.

## **Citizen Participation in Public Policy Planning**

While citizen participation has become a commonplace element in many planning efforts, both planners and citizens often assess the participatory elements as being unsatisfactory. The contention in this article is that not enough attention is being given to the design of participatory programs and that there is a particular failing in matching objectives to techniques. Five objectives of citizen participation are identified: information exchange, education, support building, supplemental decision making, and representational input. Then through the development of a typology of participatory mechanisms, techniques are matched with their most appropriate objectives. This relationship is further illustrated by examining four techniques in detail. The conclusions suggest that if the relationship between objectives and techniques is ignored in the design of a participatory program, the probability of a successful program decreases. Source: Glass, 1979.

## **Class Project**

The Class project is an experiment in technology innovation and engineering work practice that began in November 1989. The project is a joint undertaking of Xerox Corporation and Cornell University. The project aims at digitally preserving 1000 brittle books from the Cornell University libraries using Xerox proprietary digital-image technology and subsequently reprinted on acid-free paper and returned to circulation. This article tells the story of a participatory co-development project involving a commercial engineering team and an external customer. Source: Anderson and Crocca, 1993.

## **Community Participation in Riverfront Development**

A community-building approach was employed in a small mid-western town bounded by the Ohio River. Community members were involved in a riverfront development project through a variety of activities such as students brainstorming their ideas, and surveys that generated over 200 ideas for the riverfront. Idea-sharing sessions were also held

with neighborhood focus groups to gauge the views of a cross-section of citizens about the future development of the riverfront. These activities culminated in a community workshop where 130 citizens began the planning process by revisiting the riverfront through a narrated photographic tour, and reviewing a video summary of the focus groups. Twenty-two groups then identified recreation objectives and located activities on a map of the riverfront. Workshop results formed the basis for a subsequent design proposal followed by implementation of the first phase. Source: Sanoff, 2005.

### **Computer games**

In the computer games industry modding has evolved into a development model in which users act as unpaid “complementors” to manufacturers’ product platforms. An article explains how manufacturers can profit from their abilities to organize and facilitate a process of innovation by user communities and capture the value of the innovations produced in such communities. Examples are Counter-Strike, TheForce.net and Desert Combat. Sources: Jeppesen, 2004; Trendwatching.com; Wise and Hogenhaven, 2008.

### **Crowdspirit**

Crowdspirit ([www.crowdspirit.com](http://www.crowdspirit.com)) is an intermediary web service with a focus on electronics design, where the community members send ideas, develop them and then vote for the best one. The best ideas and their product specifications are jointly defined with the partners. After that the community investors start financing the product development. The first prototype of the product is tested and developed by the community. Finally, the product is launched and marketed with the help of the existing CrowdSpirit supply chain. The idea is that the community members offer the product support and recommend the product to retailers in its launching phase. Sources: Antikainen et al., 2006; Antikainen and Väättäjä, 2008; Trendwatching.

### **Dell IdeaStorm**

On February 16, 2007, Dell invited end users to share their ideas and collaborate with Dell to create or modify new products and services through an online community — Dell IdeaStorm ([www.dellideastorm.com](http://www.dellideastorm.com)). With the launch of this website, Dell created a user innovation community where end users freely reveal innovative ideas with community members and Dell. Through IdeaStorm, end users contribute their business ideas to be reviewed, discussed, and voted upon by the user community. Almost immediately, Dell learned its toughest lesson, when it was suggested to install Linux and other OSS applications on Dell computers. Dell initially declined such requests, but when the community started to mob, Dell succumbed. Sources: Di Gangi & Wasko, 2009; MarketingMax, 2008; Hunt, 2009.

### **Electrolux Design Lab**

Home appliance manufacturer Electrolux has an annual Design Lab contest, which invites design students from around the globe to submit ideas based on a specific theme. Previous themes have included designs to encourage healthy eating habits and designing eco-friendly, sustainable solutions. The winner receives an internship at one of the company’s Design Centres. To improve the quality of entrants and make them more focused and relevant, the Design Lab briefings have become increasingly narrow on specific themes, aiming for quality over quantity. Source: Davey, 2007.

### **Electrolux Gnistan**

The Electrolux Group is a Swedish manufacturer of home and professional appliances. As an answer to increasing costs and competition, the company adopted a user-driven approach to innovation which is called Gnistan (the spark process) in 2002. The whole process focuses on identifying the true consumer’s needs and developing solutions that cover broader areas of consumer segments. The Customer Insight Group is a 15-person

team, which assists the company in learning more about consumer insight methods and adopts new procedures and notions in innovation. The whole procedure includes observation (home videos, film making) to define the latent user needs, mapping and classification of the different consumer needs, and finally brainstorming and suggesting solutions to meet the specific needs determined at the earlier stages. Moreover the process includes personal visits to consumers' houses in order to examine the use of the appliances. Source: Wise and Hogenhaven, 2008.

### **FellowForce**

FellowForce (<http://www.FellowForce.com>) is an innovation marketplace and an intermediary that enables companies to submit innovation challenges to solvers. Solvers provide suggestions (pitches) to a challenge and best solvers are rewarded. Unlike other services, like InnoCentive (<http://www.InnoCentive.com>) and NineSigma (<http://www.ninesigma.net>) FellowForce allows solvers to submit their own pitches to companies, but once submitted, solvers abdicate IP rights in favor of FellowForce. Sources: Antikainen and Väättäjä, 2008; Emerce (August, 2007).

### **FIAT 500**

The concept for a third generation 500 started in 2004 with the Fiat Trepuno Concept unveiled at the 2004 Geneva Motor Show. After a failed re-launch in the 1990s FIAT decided to involve the public, consisting of fans, to co-design the car. "For the first time in the history of our company, and perhaps of the motor industry as a whole, a car will be created with the public and for the public," explained Luca De Meo, Brand & Commercial Manager for Fiat. A special website, "500 Wants You", was launched on May 3, 2006 – 500 days before the launch – and invited the public to think along about the exterior and interior of this new car. The "500 wants you" project was – and still is – an online laboratory, where users discover the stylistic concept of the new car, express their preferences, propose ideas and contribute to its creation, in a combined, active way. The website is defined as a creative space and includes several sections: (1) Homepage redesign: here web designers can create a new homepage for the fiat500.com website; (2) 500-ology: the purpose of this section is to create an online encyclopedia of stories and pictures dedicated to the Fiat 500, written jointly with the public; (3) Fiat 500 Concept Lab: here people can configure and add accessories to the new Fiat 500. It is also possible to send suggestions for new design options. Once finished, new projects can be published under the author's name and then viewed and modified by the public; (4) Design Contest: this is the most interesting part. Issued in partnership with Designboom (an independent web magazine for the design world), this contest is open to professionals, students and design amateurs from all over the world. It is divided in three sections: Accessories, Lifestyle and Places, all connected to the Fiat 500 world. The first prize for each theme will be 5,000.00 Euro. Submissions were judged by an international jury made up of personalities from the design, fashion and automotive industries and a selection of the best works were published by Designboom. The contest ended in September 2006. Source: Autoweek, FIAT.

### **Fiskars Fisk-A-Teer**

Fiskar Corp. is a 350 year Finnish manufacturer of scissors. Its office and hobby division improved the corporate image and reputation by involving female scrapbookers as advocates that recruited other scrapbookers for an exclusive online brand community called 'Fisk-A-Teers'. Within 5 months online discussion increased by 400 percent, and the brand advocates totaled over 1400. Source: MarketingMax, 2008.



### **Fluevog shoes**

Shoe designer John Fluevog has a section on his site ([www.fluevog.com](http://www.fluevog.com)) titled Open Source Footwear, wherein serious Fluevog owners can submit designs for future shoes. The winning design actually gets put into production. Source: Trendwatching.com

### **Flickr**

Flickr is an extremely popular photo-sharing site that allows users to post their photos. One way that Flickr has grown in popularity is by allowing its members to become partners in distributing the site's content. The company created a "widget"—a small piece of code that can be inserted into a site's or blog's template—that allows Flickr users to show their photos on their blog or site and directs visitors to the Flickr main site.

### **Gold Corp**

Gold Corp is a Canadian mining company that was struggling to turn up sufficient finds until it published all of its most sensitive data (maps and geological surveys) on the internet, offering a reward to anyone who could help them more accurately prospect for gold. Helped by the collective power of geologists, prospectors and academics worldwide, Gold Corp massively increased its finds and therefore its share price. Source: Powell, 2009; Tapscott and Williams, 2007.

### **Google**

Google has always been open to suggestions and comments from its millions of users: Google's social networking site Orkut includes two communities with over 1,000 subscribers: "What Should Google Do?" and "What Should Orkut Do?" And on Google's own [business blog](#), visitors are encouraged to send their suggestions to [gblog@google.com](mailto:gblog@google.com). Source: Trendwatching.com

### **Hovercraft**

The development of the first British hovercraft took place in the 1950s, where there was no explicit customer involvement. Having surmounted this initial hurdle of demonstrating the commercial practicality of a more radical technological design, the role of actual (and potential) hovercraft users became increasingly important in subsequent developments. Aside from having to meet specific user requirements, *direct* involvement of the user was applied in the case of the AP1-88 to reduce potential mismatches between producer and user design specifications by establishing a *common* design brief. Source: Rothwell and Gardiner, 1985.

### **innerTee**

innerTee ([www.innertee.com](http://www.innertee.com)) allows originators (artists) to create t-shirt designs and other users (mixers) to make redesigns of these original designs. Mixers can also sell their creations to others. In both cases, the originator (artist) gets a provision and earns respect and attention in the community. From business perspective Innertee is similar to a service called Threadless.com: all designs are voted and only those designs that get enough votes will be manufactured. Design is outsourced to users and manufacturing of t-shirts is outsourced as well. Source: Ahonen et al., 2007.

### **InnoCentive**

Pharmaceutical maker Lilly launched InnoCentive ([www.innocentive.com](http://www.innocentive.com)) in 2001 as a way to connect resources outside the company – people who could help in developing drugs. From this starting point, InnoCentive invited other firms which were also interested in ad hoc experts. Companies like Boeing, DuPont, and Procter & Gamble now post their scientific problems on InnoCentive's Web site; anyone on InnoCentive's

network (about 140,000 specialists all over the world) can take participate in solving them. Source: Ahonen et al., 2007.

### **iPod Lounge**

At <http://www.ipodlounge.com/>, avid iPod users congregate not only to talk about their favorite device, but also to show the world (and thus Apple) what they would like the next iPod to do and to look like, or adaptations they've already created in their basement or garage. Source: Trendwatching.com

### **iTunes**

Yes, another Apple example, this one partly 'owned' by Apple. At Apple's [iTunes store](#), user-created playlists enable customers to upload their favorite music selections and share them with other customers, who can then buy the songs if they like what they hear. Source: Trendwatching.com

### **Kite Surfing**

In this paper, we analyze the way users improve or develop novel products. The field of our research is a new and rapidly evolving consumer market, the sport of kite surfing. We identified a sequence that underlies the approaches of user inventors. This sequence consists of two major stages, (1) idea generation and (2) idea realization, each stage is further subdivided. We propose that a manufacturer can significantly profit from more closely observing such user activities. Source: Tietz et al., 2005.

### **Linux**

Linux originated as a hobby project of Linus Torvalds and is considered one of the most exemplifying cases of Open Source Software. Users are encouraged to use the software source code for further development of applications and the operating system. Sources: Garud et al., 2008, Moon and Sproull, 2001, von Hippel and Krogh, 2003

### **Lonely Planet**

The travel community meets at the [Lonely Planet Thorn Tree](#), an online bulletin board with over 5,000 posts a day (Lonely Planet also receives around 1,000 emails and letters a week from customers, helping them to constantly fine-tune their content). Source: Trendwatching.com

### **Machine Tools**

This article reports on research assessing the performance impact of (1) the intensity of customer interaction in different stages of the new product development process and (2) the characteristics of the involved customers. The research is based on field interviews as well as statistical analyses of a sample in the machinery industry. Results indicate that customer interaction during certain stages (but not others) of the new product development process has a positive impact on new product success. The characteristics of the involved customers have a significant effect on new product success as well. As an example, collaborating with financially attractive customers or customers exhibiting lead user characteristics increases new product success. Source: Gruner and Homburg, 2000.

### **Management Information Systems (IT)**

This article examines the implementation of the Lead User method for gathering new product ideas from leading edge customers by an IT firm that had not previously done much customer research during their new product development efforts. Besides the ideas generated, management at the firm is also impressed with the way the method makes their new product development process more cross-functional and they plan to make it a part of their future new product development practices. Approximately one year later the

firm is revisited to find out if the Lead User method has become a permanent part of their new product development process. The authors find, however, that the firm has abandoned research on the customer despite the fact that several of the lead-user derived product concepts had been successfully implemented. Management explanations for their return to a technology push process for developing new products include personnel turnover and lack of time. Using organizational learning theory to examine the case, the authors suggest that the nontechnology specific product concepts generated by the lead users were seen as ambiguous and hence overly simplistic and less valuable by the new product development personnel. The technical language spoken by the new product personnel also increased the inertia of old technology push development process by making it more prestigious and comfortable to plan new products with their technology suppliers. Source: Olson and Bakke, 2001.

### **Medical Equipment Innovation 1**

The empirical data provided by the Dutch medical equipment industry describe the distribution of innovation across manufacturers, users and various third parties. The evidence points to the relevance of interacting with both potential users and various third parties. Nevertheless, essential differences exist between the interactions with both types of cooperation partners. A detailed case description furnishes substantial insight into the intricacies and pitfalls of developing industrial innovations within complex networks. Source: Biemans, 1991.

### **Medical Equipment Innovation 2**

It has been empirically observed that 'under-standing user need' and 'good internal and external communications' are factors which discriminate strongly between commercially successful industrial product and process innovations and those that fail. The research reported in this paper examines how the innovating firm achieves desirable levels of these factors through multiple and continuous interaction with the user throughout the innovation process. In the sample of thirty-four medical equipment innovations from eleven companies, twenty six (76 per cent) were developed through multiple and continuous interaction, resulting in twenty two (65 per cent) of these being successful. Source: Shaw, 1985.

### **Mountain Bike**

In a study of innovations developed by mountain bikers, we find that user-innovators almost always utilize "local" information – information already in their possession or generated by them selves – both to determine the need for and to develop the solutions for their innovations. We argue that this finding fits the economic incentives operating on users. Local need information will in general be the most relevant to user-innovators, since the bulk of their innovation-related rewards typically come from in-house use. User-innovators will increasingly tend to rely on local solution information as the stickiness of non-local solution information rises. When user-innovators do rely on local information, it may be possible to predict the general nature of the innovations they might develop. Source: Lüthje et al., 2005.

### **Niketalk**

A lot of talking and commenting goes on at <http://www.niketalk.com/>, the non-affiliated online sneaker community which so far has received more than 200 million visits and 3.5 million posts. Every Sunday at 9 PM EST, their sister site, chat room [NikeChat](#), welcomes Nike fans from around the world, to exchange views, tips and more. Source: Trendwatching.com

## **Nu.nl**

In Holland, this popular 24/7 news site encourages readers to send in breaking-news pictures (since virtually everybody owns a digital camera or camera phone these days). The best images are also sold to ANP, the country's main news agency, who then pays these citizen photographers up to EUR 60 per shot. Source: Trendwatching.com

## **Obama**

Obama's team built something truly world-changing: a new kind of political organization for the 21st century, which helped him win the presidential elections in 2008. Obama's organization was self-organizing, resilient to attacks, had a simple strategy with a maximized purpose, was broadly united, and had the power to inspire, lead and engender belief by mobilizing the community of the USA for the change programs. Sources: Hunt, 2009; Bloem, 2009; Powell, 2009; Haique, 2008.

## **OhMyNews**

This South Korean online newspaper works with 26,000 'citizen reporters', who send in stories and pictures which make up 80% of all content. OhMyNews pays up to USD 20 per article, though for many citizen reporters, getting their name in the paper is the real reward. Source: Trendwatching.com

## **OPAC**

The characteristics of innovation, innovators, and innovation sharing by library users of OPAC information search systems in Australia are explored. This market has capable users, but it is nonetheless clearly a follower with respect to worldwide technological advance. Twenty-six percent of users in this local market do modify their OPACs in both major and minor ways, and OPAC manufacturers judge many of these user modifications to be of commercial interest. Many innovating users freely share their innovations with others, and those that do share information about modifications can be distinguished from those who do not. Source: Morrison et al., 2000.

## **Owela**

Owela (<http://owela.vtt.fi>) is a participatory web laboratory for designing digital media products and services. It aims to be a conversational web community that connects members with developers and researchers and promotes open innovation. Owela offers social media tools for gathering member needs and development ideas as well as collecting feedback for scenarios and prototypes. Source: Antikainen and Ahonen, 2007; Jäkälä, 2007; Antikainen and Väättäjä, 2008.

## **Palm 1000**

Similar to what Apple did with the Apple II computer, Palm involved many developers and users for the development of applications when it introduced the model 1000 in 1996. What Palm did was to make its development environment and development tools freely available instead of licensing it, and this increased the interest among over 300,000 potential developers to make programs and applications for the Palm OS. Palm offered developers formal training, company-hosted meetings, and even hired staff to answer their questions. Sources: Häglund, 2005; Friesen, 2001.

## **Philips Streamium Café**

It's where owners of Philips' new Wi-Fi TV sets and hifi systems tell Philips where they think Streamium is going, and what Streamium should be able to do. Current discussions involve everything from the time format on the appliances' display to 'Support for Real Player RadioPass + Real Rhapsody.' Source: Trendwatching.com

### **Rabobank**

Rabobank, a Dutch cooperative bank in the Netherlands, started the Innovation Challenge on Hyves, a social network that is very popular in the Netherlands. Everyone interested could submit a creative idea on a special Hyves-page, from which the most promising ones were selected and could present themselves on Emerge eDay. Source: Emerge (August, 2007).

### **Rodeo Kayak**

In this study, we analyze the commercialization process of user innovations in open communities. We have traced 16 cases of user innovators who have commercialized their own innovations or have been involved in the commercialization process to some extent. By developing and manufacturing new products, the user innovators in our sample created a fast-growing community. They used low-cost manufacturing techniques and were able to start a new industry before established manufacturers could enter the market. The transformation process from a user innovation community to a commercial and manufacturing community brought about a number of major changes. In this paper, we track those changes as: the motives for innovating, the community size and characteristics, the type of innovation, the type of assistance and the disclosure of information, the form of communication, and competition between innovating users. Source: Hienerth, 2006.

### **Salesforce.com IdeaExchange**

Salesforce.com Inc, an online CRM-application developer, launched IdeaExchange in 2006 which enables its customers to propose new functionalities as well to vote for their popularity. Because of IdeaExchange Salesforce.com started to release new applications and managed to stay ahead of its competitors. Source: MarketingMax, 2008.

### **Scientific instruments**

Author describes several cases of development of scientific instruments where users (i.e. laboratory professionals) were the generators and developers of some major innovations in the field of scientific instruments. Source: von Hippel, 1976.

### **Spreadshirt**

Spreadshirt.com is an online apparel company that allows people to design, buy and sell custom merchandise on the Web. When a customer wants to sell own designs or existing designs, they can get a free customizable shop (= platform). Source: Antikainen et al., 2006.

### **Sulzer Weaving Machine**

This was a radical design innovation that passed through ten prototype stages over many years before the commercial launch of the Mark II version. Throughout its development the Sulzer loom was tested regularly in the weaving mills of potential customers and it was feedback from these that provided much of the impetus for further re-design. Source: Rothwell, 1986.

### **Sun Jini**

When Sun launched the Jini technology in 1999 it was a large corporation that had been successful and prosperous, but it still would not be an easy task to successfully put Jini on the market. An important aspect for Sun was therefore to convince potential customers about the benefits of Jini, for even though everybody could see in the visions that it seemed to be a great idea it was more difficult to understand what the benefits would be in daily use. By creating the Jini Community Sun tried to find a way of promoting co-operation between vendors who otherwise would be fierce competitors.

This does not only mean that companies have free access to the source code of Sun's implementation of Jini but also that members have access to a wide range of resources and forms of expertise that are intended to aid in accelerating the innovation and success of individual companies. Source: Häglund, 2005.

### **Telia SMS services**

An empirical experiment from a telecom provider where a R&D department provided a technical platform called Unified Services™ (US) for sending and receiving SMSs. Participants were current or potential customers of the company and frequent users of mobile phone communication. All user participants were given the task of inventing new service ideas that would provide them with added value, and the professional service developers were instructed to design services that they thought would bring value to the customers. Results showed that customer ideas are more innovative than those from professional developers. Source: Matthing et al., 2004.

### **Threadless**

Threadless.com is a young Chicago-based fashion company that focuses on t-shirts with colorful custom graphics. All products sold by Threadless.com are created by its user community. The proposed designs are inspected, approved and voted for by users before the production process starts. This way, company can ensure that markets exist even before making any investment decisions to new products. Sources: Antikainen et al., 2006; Mäkipää et al., 2006; Ogawa and Piller, 2006; Hunt, 2009; Powell, 2009; Ogawa and Piller, 2006.

### **TiVo**

For the past four years, the 65,000 members of the self-organized TiVo Community forum have traded ideas on 'how to convince friends and family to buy a TiVo', 'how to deliver impromptu sales training sessions to Best Buy employees whose sales pitches need work', or 'how to be a better TiVotee'. Source: Trendwatching.com

### **Virtual Tourist**

The travel community also meets at [Virtual Tourist](#), where 400,000 members from over 219 countries share insights and experiences to help each other travel smarter, from finding the best place to get great airfares, accommodations or car rentals, to solid insider advice on what to see and do. Source: Trendwatching.com

### **Wikipedia**

Wikipedia is an online encyclopedia of which the content is created and maintained by users, the so-called user generated content. As of 2006, it had become one of the most visited websites in the world, with 5 billion page views monthly. Sources: Garud et al., 2008; Tapscott & Williams, 2007.

### **Yamaha and Ryohin Keikaku**

New products suffer from notoriously high failure rates. Many new products fail, not because of technical shortcomings, but because they simply have no market. Not surprisingly, then, studies have found that timely and reliable knowledge about customer preferences and requirements is the single most important area of information necessary for product development. To obtain such data, many organizations have made heavy - but often unsuccessful - investments in traditional market research. The authors provide an alternative. Companies including Threadless, Yamaha and Ryohin Keikaku have begun to integrate customers into the innovation process by soliciting new product concepts directly from them. These firms also ask for commitments from customers to purchase a new product before the companies commence final development and manufacturing. This

process - called "collective customer commitment" - can help companies avoid costly product failures. In essence, collective customer commitment enables firms to serve a market segment efficiently without first having to identify that segment, and it helps convert expenditures in market research directly into sales. Source: Ogawa and Piller, 2006.

## Appendix E. Assessing and accessing customer knowledge

In this Annex/Appendix we elaborate on the techniques to support the assessment and access of customer knowledge, as reflected in Design Proposition # 3.

### Customer Knowledge Management (CKM)

Most companies today consider themselves as market driven, or customer-oriented. Yet only a few companies are actually managing well their, perhaps, most precious resource: the knowledge *of*, i.e. residing in their customers, as opposed to knowledge *about* their customers (Davenport et al., 2001). Practice-based view to knowledge suggests that customer knowledge is constructed in social interaction and negotiation between people inside and outside of a company. Customer knowledge does not entail facts, rather it consists of interpretations of various people and is always open to negotiation and dispute (Hislop, 2003).

By managing the knowledge of their customers, companies are more likely to sense emerging market opportunities before their competitors, to constructively challenge the established wisdom of 'doing things around here', and to more rapidly create economic value for the corporation, its shareholders, and last, but not least, its customers (Kanter, 2001). CKM is the strategic process by which cutting edge companies emancipate their customers from passive recipients of products and services, to empowerment as knowledge partners. CKM is about gaining, sharing, and expanding the knowledge residing in customers, to both customer and corporate benefit. It can be both qualitative and quantitative, relying on customer or salesperson comments or detailed transaction data. It can take the form of prosumerism, mutual innovation, team-based co-learning, communities of practice, and joint intellectual property (IP) management (Davenport et al., 2006). These have been identified as five styles of CKM, which are distinctively different practices, but not mutually exclusive (Gibbert et al., 2002). The process of co-creation or customer participation can help in improving data quality, since data collection becomes an integral part of the value creation process (Kim & Wilemon, 2002; Lagrosen, 2005; Prahalad & Krishnan, 2008; Zhang & Doll, 2001).

At first glance, CKM may seem just another name for Customer Relationship Management (CRM), see Peelen et al. (2006) or Knowledge Management (KM), see Weggeman (1997). But customer knowledge managers require a different mindset along a number of key variables. Customer knowledge managers first and foremost focus on knowledge of the customer, rather than focusing on knowledge about the customer, as characteristic of customer relationship management. In other words, smart companies realize that corporate customers are more knowledgeable than one might think, and consequently seek knowledge through direct interaction with customers, in addition to seeking knowledge about customers from their sales representatives (Davenport et al., 2006). Rather than trying to control the relationship with customers, the company must be a willing and active participant in a dialogue with its customers (Winsor, 2006).

Traditionally, market research was used to shed more light on what the customer knew and thought about the product, and how this differed from what the company had to afford the customer, resulting in enormous CRM databases. More recently, firms thought they had found a new approach to access customer knowledge. Drawing on best practices from service companies, such as the big consulting businesses, most large organizations have instituted KM systems. These systems, however, are based on an indirect understanding of what customers want. KM-systems are typically geared towards disseminating what their sales force or intermediary has understood from



listening to the customers who bought – or did not buy – the company's products (Davenport et al., 2006).

Smart firms realize they can't just collect data. The data has to translate into something meaningful about existing or potential customers. This requires first understanding which transaction-based approaches will provide the right data. It may also mean mixing transaction and human data; this will lead to the best results in CKM. Firms then have to think creatively about the acquisition of human data. Many techniques can be used: customer forums, monitoring customer service calls, having all employees use the company's products so they know firsthand what customers are talking about (Davenport et al., 2001). Recent contemporary and effective techniques could be the qualitative, long interview (McCracken, 1988), with the Zaltman Metaphor Elicitation Technique (ZMET) as a combination of the long interview with the use of metaphors (see section Appendix G), ethnographic research (Grover & Vriens, 2006; Stewart, 1998), popularly called 'customer safari' (MOLBlog, 2007), and the 'customer journey'-approach (Emberton & Stanley, 2008; Voss & Zomerdijs, 2007), the latter one also consisting of a technique for finding and implementing solutions to wants and needs encountered in the data acquisition, with the aid of the customer. Customer Journey Mapping is a tool for visualizing how customers interact with people and organizations in order to make a purchase or experience a service. Customer Journey Mapping comes from the corporate sector and market research. It can be used as a form of consultation to improve a service through finding out how people use the service and how they interact with the service provider. It provides a map of the interactions and emotions that take place, and can help an organization provide its customers with the experience it wants them to have. These modern techniques do not exclude each other, contrary, it is recommended to use combinations of such techniques. What is important for our research is that assessing and accessing customer's knowledge can only be achieved observing individual customers and engaging them into a dialogue, which we will refer to as customer interviews.

### **Customer interviews**

As observed in the previous sub-section, the assessment of customer knowledge as well as the elicitation of their subconscious thoughts can be achieved through interviews. An increasing number of tools and structured frameworks are now available for trying to identify, clarify, articulate and communicate 'the voice of the customer' throughout the organization. Based on the principles of QFD these tools usually take as their starting point the customer needs as expressed in the customer's own words or images and gradually and systematically decompose them into tasks for the various elements within the organization (Tidd et al., 2001). An excellent instrument to explore people's needs through their thought processes and what is important to them are personal interviews (Aaker et al., 2000; de Ruyter & Scholl, 2004). This makes it highly suitable for eliciting latent and unarticulated needs of customers (Kharmouch, 2001). Latent needs can be referred to as what customers really value or the products and services they need, but have never experienced or would never think to request (Senge, 1990). In order to uncover these latent needs the interviewer has to *listen* carefully to the customer (Flores, 1993), which requires more than simply hearing and understanding the words said. It demands attention to other aspects of conversation: body language, facial expressions, gestures, tone of voice, use of language (metaphors, analogies), and all the rest. Listening, then, is a good deal more than the information-gathering of traditional market research.

Interviewing originates from the social sciences, but is also applied in market research. There are roughly three ways of interviewing: the in-depth interview, the semi-structured interview and the group interview – the first two ways are done with individuals, while the latter one is done with a group of participants.

The unstructured, in-depth interview, normally referred to as the face-to-face interview, is particularly suited to get a maximum of information, while, in the meantime, the interviewer tries to influence the participant the least as possible (Willems et al., 1988). The interviewer performs on the hand of a checklist that gives direction to the conversation, but leaves results dependent on what the interviewee answers. By using indirect questioning, the interviewer aims to get as much understanding as possible from the respondent on his latent, unspoken needs. Face-to-face is intended to note not only the verbal information, but also the non-verbal information that participants convey – facial expressions, body language. By depth the extent to which researchers explore not only the rational motives, but also the emotional drivers that determine customers' behavior (de Ruyter & Scholl, 2004; Flores, 1993). The interview can be long (1 to 2 hours) and is therefore often referred to as the *long interview*. We will see, however, that the long interview is a specific form of unstructured interviewing. Because of the abundant information from just one interview, the amount of interviews is usually limited to 10 to 20, because a saturation point is reached in the opinions that are forthcoming from the participants (de Ruyter & Scholl, 2004; Willems et al., 1988). Because of this small amount of participants it is more important to use the results to generalize about the subject than that it is to generalize about the population (de Ruyter & Scholl, 2004). Therefore, the sample of participants does not necessarily have to reflect a quantitative, demographic representation of the targeted group. The exact sample size is dependent of the homogeneity of the target group and number of segments it comprises of (de Ruyter & Scholl, 2004).

Typical individual depth interviews last from one half to a full hour or more depending on project requirements. These issues employ a focused interview strategy in which the questions are generally open-ended and non-directive, allowing the discussion to follow the subjects' response and issues (Arnould & Epp, 2006).

In a depth interview based study, anywhere from 5 to 50 informants may be interviewed (Arnould & Epp, 2006).

Interviewing in a respondent's natural environment may make them more comfortable, and hence more likely to provide detailed personal information. In addition, aspects of the environment can be discussed (Arnould & Epp, 2006).

Depth interviews facilitate a high degree of psychological depth, that is, investigations of informants' life world, identity, motivations, and desires and their associations with market offerings (Thompson, 1997;2003; Thompson et al., 1990).

The semi-structured interview uses a semi-structured questionnaire. Questions have been set in advance, but the interviewer has the freedom to rephrase the questions, and to question further on answers received from participants.

The group interview is performed with a group of participants, varying from 5 to 10, depending on the depth and kind of questions. In the group interview the interaction between participants is important (Sweeney & Perry, 2004) – interaction between participants leads to a more informal setting, that enables spontaneous and unconscious reactions from participants (de Ruyter & Scholl, 2004; Willems et al., 1988). Group interviews are more likely to divulge information relating to the breadth of a subject – lateral thinking, associations- while individual interviews are more likely to produce information about the depth of a subject – causal and hierarchical issues (de Ruyter & Scholl, 2004). Today, group interviews are used in marketing to generate hypotheses, explore opinions, attitudes, and attributes, test new product ideas, evaluate advertisements and identify and pre-test questionnaire items (Carson et al., 2001; Fern, 1982; Sweeney & Perry, 2004). However, contrary to surveys or quantitative research, with group interviews no claims should be made about the ratios of opinions within the

target group. The emphasis is on how participants talk about products, markets, and their behaviors (de Ruyter & Scholl, 2004). The key to focus group achieving research objectives is cohesion, i.e. it is necessary for the participants to be cooperative, friendly and supportive of each other's accomplishments (de Ruyter & Scholl, 2004; Sweeney & Perry, 2004). Cohesion can be obtained by mixing genders and ensuring similar personal characteristics and socioeconomic backgrounds, and excluding friends and hostile members because both can impair group formation and interaction (Fern, 1982). Importantly the participants must share the common experience that is key to the research problem (Asbury, 1995). However, in B2B-situation this might pose a problem, since participants will probably be competitors of each other, unless they belong to the same company. Being competitors might impair their frank contribution or lead to biased discussions. Because of this group discussions are not very well suited for B2B-problems, unless commercial secrecy, IP-rights, and disclosure have been tackled properly. Furthermore, face-to-face, personal interviews are more cost-efficient than group interviews – less participants are needed for a complete insight (Griffin & Hauser, 1993).

However, for certain types of issues, a mix into the same group is preferred: spouses, siblings, physicians and nurses (but usually not ones who work with each other), bosses and employees, parents and children, users and non-users, enthusiasts and rejecters. While it is usually undesirable to have these combinations in the same group because of the defenses they often erect in each others' presence, there are other times when "undesirable combinations" may either serve as foils for each other, or may engage in constructive dialogue which gets one beneath the surface (Silverman, 2000). Screening may help to eliminate potential problems, but if it does not the moderator needs to affirm that the opinions of all members of the group are valuable (Sweeney & Perry, 2004). This poses great responsibility for the moderator. He has to be not only a nominal leader, but also, supportive, able to establish rapport, be comfortable with group dynamics, keep the group on track, maintain enthusiasm and promote free discussion, because too much moderator control would inhibit group interaction (Sweeney & Perry, 2004). In group interviews, decisions have to be made about client attendance at the groups, the number of clients who will attend and any communication between them and the moderator during the group sessions (Greenbaum, 1988). Sweeney and Perry (Sweeney & Perry, 2004) give, based on research of typical literature a comprehensive overview of steps and activities that one can make in order to prepare, execute, analyze and report group interviews.

Face-to-face interviews, including group interviews in a physical environment, are generally classified as a qualitative technique. They differ completely from quantitative interviews, which are usually carried out by telephone. Qualitative research is not used to quantify things but rather to gain an understanding of things, to gain insights. That insight comes about through a process of analysis and meaningful integration of statements from participants (de Ruyter & Scholl, 2004).

While interviewing or discussing with the customers in the front end of the innovation process, it is advisable to focus on benefits and outcomes the customers expect the new services to offer rather than focus on ultimate solutions or the make up of a new service (Alam, 2006b). The main argument is that the customers cannot tell a firm exactly what a product should look like because they are poor reporters of their own needs (Ulwick, 2002).

So, we can observe that serious consideration must be given beforehand to aspects of interviewing, like sample size and structure, length of the interview, flow of the discussion, and finally the way the research subject is questioned. Systematic design and use of questioning techniques improves the quality of interviews (de Ruyter & Scholl, 2004). Also, serious attention should be given to the skills and personality of the interviewer, moderator or facilitator, which has to be objective, a leader, and supportive

to participants. Much has been written about designing, preparing for and executing individual and group interviews (Buber et al., 2004; de Ruyter & Scholl, 2004; Grover & Vriens, 2006; Gummesson, 2000; McCracken, 1988; Willems et al., 1988).

The customer interview uses a number of methods which function mainly as tools. There are two basic types, which can be used independently of each other, but in practice we see methods developed and branded as a combination of both (de Ruyter & Scholl, 2004):

- Elicitation techniques, used to elicit certain responses from participants, like primary responses, subconscious emotions, imagery associations, positive or negative aspects, etc. Of these, projective methods are important; they require participants to form some kind of imagery that reveal their true thoughts and feelings.
- Analysis methods or models, which consist of the interpretation of participants' behavior and placing it into a broader context. The results are interpreted using well-defined and often scientifically tested models.

We will now cover some particular methods or techniques that are highly suitable for our customer involvement innovation purposes.

### **Critical Incident Technique**

When doing customer satisfaction surveys or quality of service surveys, the problem is usually to understand what respondents exactly mean by the pre-defined answers like satisfactory, good quality, etc. Their perceptions of such construct do not have to reflect those of the company. What do people really think when confronted with such abstract or meaningless attributes? The Critical Incident Technique is a technique that takes into account the respondent's own perceptions. It is an interview technique that departs from two questions: "Can you describe to me an instance or a situation which appealed attractive, positive, satisfactory to you?" and "Can you describe an instance or situation that made you dissatisfied, unsatisfactory, unattractive to you?" The exact formulation is crucial and has to be based on the objective one has with the interview and can therefore be in some other wording than these examples. When given an answer on the question it is further elaborated on to establish the exact determinants of the satisfactory or unsatisfactory experience for the participant.

The reactions of the participants are not restricted by preconceived ideas about what the response categories will be, and can lead to a rich source of ideas for developing new products or services (de Ruyter & Scholl, 2004).

### **Cognitive Mapping**

A renowned proverb says: "One picture is worth a thousand words". Making thoughts visible helps display relationships in different ways other than in words and mathematics. An active deployment of graphic tools would derive a better conceptualization of ideas, patterns, relationships, and insights that are derived from the interview (Chang, 2008). Causal or cognitive mapping is a simple but powerful technique that can help managers to identify routines that are central to the company's success (Wührer, 2004). Cognitive maps are action-oriented visual representations of the world, the way people perceive it. They are a set of relationships between both tangible and non-tangible ideas and events which guide an individual or group's thought process and actions (Bettman, 1979; Wührer, 2004). Cognitive mapping is used in various scientific disciplines like neuroscience, linguistics, philosophy, cognitive psychology and knowledge management. It was developed as an extension of repertory grids (Kelly, 1963). The mapping of cognitive structures in general is a growing research field in management science

(Iacobucci, 1998; Portugali, 1996). Its purpose is to catch the 'personal construct system' (Wührer, 2004).

The basic elements of cognitive maps are entities which describe constructs. The constructs have certain qualities, or attributes. As these qualities or attributes differ between constructs they lead to a distinction and eventually relations, e.g. causal or simple association, between them. The importance of certain relations or structures in such a map depend on the frequency of use and representativeness (Aurifeille & Valette-Florence, 1995). So, cognitive maps represent both content and structure of people's mental models. Content refers to the actual ideas or concepts represented by the model, i.e. the personal meanings contained therein. Structure refers to how that content is organized in memory (Christensen & Olson, 2002).

Research that involves cognitive mapping uses a number of distinct elicitation techniques based on different methodologies (Roedder John et al., 2006). Data gathering can be done by means of interviews or group discussions. The main elicitation method for market research objectives is the means-end chain method, which was developed to elicit and analyze consumer cognition rather than managerial cognition. The means-end chain approach evolved from the work of Kelly (Kelly, 1963), developed for consumer behavior by Gutman (1982;1997), assumes a hierarchy in goals that people strive for (Christensen & Olson, 2002; Pieters et al., 1995). Goals can be grouped into three levels: (1) action goals which are concerned with the act itself; (2) outcome goals, which are the immediate effects of those actions; and (3) consequences, which are indirect effects stemming from the outcomes (Gutman, 1997). Pieters et al. (1995) enhance the goal structure by incorporating both the relatively concrete level of specific action plans, which is concerned with the how of behavior, and the more abstract level of values and motives, which provide the ultimate reasons for pursuing a course of action and thus constitute the why of behavior. Value of a product, action, service, etc. to a person is not merely a matter of its monetary value; value consists of five independent value categories that contribute incrementally to choice. They are: (1) functional value (utilitarian); (2) social value (status, social image); (3) emotional value (feeling or affect); (4) epistemic value (curiosity, novelty, knowledge); and (5) conditional value (in the specific situation). In regard of this latter one, the situation in which a person makes a decision, may influence the path to the end decision, while the outcome may remain the same (Pitts et al., 1991). Maximizing all five is desirable, however, not always practical (Sheth, 1991). A common output of a means-end study is a tree-like network diagram called Hierarchical Value Map (Gutman, 1982), which can be thought of as an aggregate (e.g. market-level) cognitive map (Gengler et al., 1995). Mappings at an aggregate, super-ordinate or conceptual level do more than mappings of individual level. In the ZMET™ the aggregate map is called a consensus map (Zaltman, 2003). An alternative for the means-end-chain approach, as is applied in the mapping of ZMET™ (Christensen & Olson, 2002), is the Brand Concept Mapping (Roedder John et al., 2006), which makes use of existing market research, i.e. salient associations from the target consumer group. We will not elaborate on this technique.

Maps, such as cognitive maps can be used both as a guide to the definition of a strategy and also as a means to their externalization and communication. Cognitive maps are characterized by two ontologies: concepts and relationships (usually causal relationships) among them, as they are defined by those who the map refers to. Relationships are usually associated to a direction and a value (that measures the intensity of the relationship). The importance of cognitive maps for IDP is stressed in. Maps are useful to reduce problems associated to communication misunderstandings (Scozzi et al., 2005).

A technique that is used to model the means-end chain is an elicitation method called laddering (de Ruyter & Scholl, 2004; Gutman, 1991; Pieters et al., 1995; Reynolds & Gutman, 1988).

When mapping, relational mappings are preferred over attribute mappings, because these generate goal-relevant inferences: they have more explanatory power and are more informative (Gregan-Paxton & Roedder John, 1997).

Procter & Gamble uses a method to build highly detailed mental maps that capture consumer's thinking about various products. The maps are based on extended discussion and interviews with typical consumers and on the input of P&G marketing people, who walk the floors with shoppers, noting what they say and what they do. With thorough mapping, the company can gain insight from just a few consumers. To evaluate products, P&G uses both mental maps and focus groups (an extension of mental maps and focus groups that involves more consumers but with less detail). It also relies heavily on statistical data from point-of-sale transactions (Davenport et al., 2001:65).

### **Convergent Interviewing**

Convergent interviewing is an in-depth interview technique with a structured data analysis process. It is used to collect, analyze and interpret qualitative information on a person's knowledge, opinions, experiences, attitudes and beliefs by means of a number of interviews that converge on important issues. In this way, more is learned about the issues involved. After each interview, the researcher refines the questions so that the subsequent interviews can converge on the emerging issues in a topic area. Convergent interviewing can be more appropriate than in-depth interviews and case research because it can provide a way of quickly converging on key issues in an emerging area, an efficient mechanism for data analysis after each interview, and a way of deciding when to stop collecting data (Rao & Perry, 2004). Its weaknesses are that there is a potential interviewer bias, that quality is dependent on interviewer's knowledge (Carson et al., 2001; Yin, 2003).

### **Long interview**

"It's what you don't know that can kill you," is a saying that savvy innovators understand. The real challenge for innovators is to establish empathy with the customer, to get out of a seller's mindset and into a user's or customer's mindset and to find a way to uncover what the customer really needs. Understanding latent – but often very real – needs that customers are unlikely or unable to readily articulate is crucial, but it doesn't happen automatically. Prospective customers often cannot consciously identify the problem or concern until they see its solution, especially for radical innovations. If customers already know they need what you plan to offer, they've probably already told someone about it, including our competitors. Many of the most exciting breakthroughs that innovators bring to market are innovations that customers haven't known they needed. I've found that many entrepreneurs and new product developers, having been advised that evidence of customer demand is necessary in their business plans, decide that the quickest and easiest way to tackle this requirement is to formulate a survey and distribute it via the Web, asking a number of questions about factors that the hope will show what people might like about their idea. That approach is problematic, for several reasons. First, since innovators often are already convinced that their idea has merit, their mindset isn't one of discovery or learning; it's one of proving why their idea will work. Second, evidence from successful venture capital portfolios indicates that what is likely to work in most new ventures isn't the plan A that the business plan so lovingly articulates. It's a yet-to-be-discovered Plan B. Third, there are at least three common reasons that Plan A is unlikely to succeed: either the initial target customer is not the right one or the initial product is not what customers will buy or the economics of the original idea simply won't work. Surveys and focus groups simply are not designed to resolve the kinds of uncertainty that the new product or new venture context entail – uncertainty about who the customers are and what they really need, and uncertainty about what technology can deliver. What innovators need is a systematic way to uncover factors or issues whose identity they don't yet know. The long interview, a well

established technique in social science research, is an excellent tool for this purpose (Mullins, 2007).

The long interview technique can draw out answers to key questions innovators need to ask – including questions they don't even know they should ask. The long interview differs sharply from more traditional guided interviews, which typically have lengthy checklists of clearly focused questions and seek direct answers to questions that the interviewer knows to ask. In a long interview, the idea is to ask only a few open-ended questions that let the respondent go where he or she may. A series of prompts – barely questions, since they are so short – are then used to encourage the respondent to say more about a theme just mentioned, or to address – again, in an open and non-directed way – another topic that's on the interviewer's mind but has gone unmentioned so far. Ideally, a long interview should be conducted in person, because respondents will generally talk longer in person and will give the interview their full attention (Mullins, 2007).

If you're like most innovators, though, chances are you've made one or more of the following mistakes that will have limited what you've learned from whatever conversations you've had:

- you've let your enthusiasm show through;
- you've focused on our idea rather than on customer concerns;
- you've asked leading questions;
- you've asked questions that can be answered with a yes or a no.

The long interview technique addresses each of these problems and serves two key purposes. First, it lets you seek answers to questions you already have without biasing the respondents. Second, it encourages prospective customers to tell you things you do not know to ask and what they would not otherwise think to tell you. That helps you discover unk-unks – the important factors you don't know you don't know. Twenty or so long interviews can provide the fuel to jumpstart this process. Try doing some, and see how many unk-unks you can discover. Find out just how much you don't know you don't know (Mullins, 2007).

### **Zaltman Metaphor Elicitation Technique (ZMET™)**

The ZMET™ is a patented technique that uses visual stimuli and metaphors to elicit mental models that drive consumer thinking and behavior, and to characterize these models in actionable ways (Zaltman & Coulter, 1995). Brands use metaphors to brand their products in advertisements and commercials. Our thoughts and reasoning are linked to the use of metaphors, in which we can express our emotions better than through words. Having people explain their thoughts and feelings in words appeals to their cognition, which makes it difficult to interpret abstract emotional concepts as 'attractive', 'satisfying', or 'enjoyable' in a meaningful way. Visual stimuli such as pictures, or objects, access these emotions in a more direct fashion and lead to intuitive reactions that give better insight into consumer perceptions (de Ruyter & Scholl, 2004).

The ZMET™ uses these visual stimuli by inviting participants to collect or make images that represent their emotional state or perception of the research subject, which can be a product, a brand, a company, experiences, or consumption, or even a social phenomenon. They take these images to a face-to-face interview where the interviewer discusses the pictures according to an interview protocol, consisting of a variety of steps to guide the conversation, using laddering and long interview techniques to get through to these emotions and their causes. The laddering technique is especially useful for

eliciting causal patterns among constructs identified by the Kelly Grid (Zaltman & Coulter, 1995). The images are chosen by the participants themselves, and not selected and presented by researchers. This control over the content allows the surfacing of 'unexpected' or 'unforeseen' information during the interview. The interview is recorded, transcribed and analyzed by means of construct coding (Glaser & Strauss, 1967; Miles & Huberman, 1994; Spiggle, 1994; Strauss, 1987; Strauss & Corbin, 1990) and cognitive mapping (Christensen & Olson, 2002). The resulting individual maps of all participants are combined in an aggregate map and analyzed for occurrence of constructs and their relations (Christensen & Olson, 2002), representing the common reasoning and thinking of participants, thus forming the consensus map (Zaltman & Coulter, 1995), that Zaltman (2003) calls the Mind of the Market. These maps represent "the socially shared, connected constructs that are most prominent in the minds of those market-segment members relative to a specific topic. In this sense, a consensus map serves as an anatomy of the mind of the market" (Zaltman, 2003:149), presenting us both content and structure of people's thoughts. Typically, it has been evidenced that an amount of only 12 to 15 respondents participating to such an interview can yield a consensus map that accurately represents the larger population (80% or more) of that market segment (Zaltman, 1997;2003; Zaltman & Coulter, 1995). Therefore, the constructs in a consensus map that are based on a small sample of participants can be representative of a larger population. This consensus map can then be used by the client's management to evaluate the current marketing strategy relative to consumer thinking, and target issues to reexamine or reconsider.

The ZMET™ is not really a unique technique in the sense that it combines several qualitative techniques like the long interview, laddering, the Kelly Repertory grid technique, and cognitive mapping in one method (de Ruyter & Scholl, 2004; Zaltman & Coulter, 1995); unique, however is the use of metaphors to elicit unconscious tacit thoughts of respondents (Christensen & Olson, 2002). The interviews are usually long (2 to 2.5 hrs), and the preparation, execution and analysis altogether can be very time consuming, making it a lengthy process. The quality also relies heavily on the researchers' expertise in both interviewing as analysis. In addition, the technique has been patented by its inventor, making universal use by ordinary qualitative researchers impossible; using the ZMET™ requires a license, for which training of researchers and license fees are required. We can therefore not give a complete description of the technique, but limit ourselves to referring to relevant literature by the author.

Its strength, however, lies mainly in the fact that researchers are able to access motives and emotions that lie deeper within the subconscious (Christensen & Olson, 2002; de Ruyter & Scholl, 2004). Also, all separate components and techniques that together shape this method have been grounded in a broad body of literature, which lends support to the technique's validity and reliability (Zaltman & Coulter, 1995). On top of that, clients' testimonials provide insight that the method has a great practical validity.

### **Online customer interviews**

With the recent developments on the Internet where interaction between users of the Internet becomes more prominent, the question arises in which way this media is suitable to conduct customer interviews online. Quantitative online market research is still booming, but little is known or published about online qualitative research. Interest for using this media is however growing. This because it has no geographical boundaries and can probably be conducted much faster than traditional research (de Ruyter & Scholl, 2004; Li & Bernoff, 2008).

In designing an online interview, some design criteria have to be met. First, the interview, be it a personal or a group interview, has to take place real-time. This excludes email interviewing. Second, we want to ensure that the respondent that we



invite to participate is actually participating and not someone else, because this will make the outcomes unreliable and invalid. Therefore, recruitment and engagement require certain security measures to ensure this. Third, when conducting an international interview, we do not want language differences to pose a problem. It seems that talking in the English language would be the best option, but it is important to understand participants' expressions for a correct interpretation. Important information can therefore be lost when admitting no other languages. It is noted that this also poses a problem with face-to-face interviews, but there it is expected that the interview will be conducted by someone who speaks the same language as the respondent, because of the physical presence. Fourth - especially when a group interview is conducted, but in some personal interviews as well, we want interaction between participants to take place similar to physical meetings, that the conversation is synchronous, meaning that participants take into account the others' non-verbal behavior, reactions, silences, etc. in forming their own responses. Online interaction inhibits this: "Is the fact that the other is not responding immediately a sign that he is thinking or not engaged?" In each other's presence we usually can sense this.

A first way of conducting an online interview is the use of a chat program like MSN or YahooMessenger. Advantage of this would be that most Internet users use chat features to connect and interact to friends and family. Another advantage would be that we dispose of the necessary records of participant's responses in writing, making transcription of interviews obsolete. Disadvantage would be that the participants have to respond in writing, inhibiting them to be elaborative in their answers, evoking short answers and holding the chance that important constructs do not surface.

This could be obviated by using video chatting, e.g. with MSN or Skype. Visualizing the discussion also enables observing of non-verbal cues, like clothing, gesturing, and dialect. A problem with this solution is that the amounts of Internet users that are equipped with a webcam are still scarce. Also, language can still pose a problem in understanding each other correctly. And in the case of group interviews a technical problem arises in the simultaneous and synchronous observation of each other. Some software developers and service providers for online market research appliances make, apart from the software, webcams to participants available, in order to meet with the first and the third objection. Implication is though, that a physical distribution has to take place, enlarging the time needed to conduct the research.

We can conclude this discussion about online interviewing with the observation that it is a technique, still in its experimental stage, but with potential when solutions are found for the typical technical and cultural problems mentioned. We can also observe that, when used, the online technique is better suited for personal interviews than for group interviews. An advantage of this personal online interview is that if the researcher has some questions after the interview has taken place, he can contact the participant again to ask the new questions (Li & Bernoff, 2008).

## **Netnography**

When physical personal interviews aren't possible or practical, e.g. in case of geographical distance, the company has to consider online assessment of customer knowledge. Technology has greatly expanded the ability of companies to better understand consumer sentiments around brands and products. Some companies are using tools such as ethnography, consumer targeting, virtual prototyping, and in-market experimentation to better understand interest in new products. This kind of research often provides valuable feedback to companies and is integral to successful consumer centric innovation. Additionally, companies are learning to better analyze all the information buried in their consumer-related databases, including loyalty programs. Some are using text-mining software to get at the product comments contained in all the

consumer-generated media available on the Internet. In addition, the ability to collect and analyze this vast amount of data, and to disseminate it across all departments, is important to the overall strategy of uncovering consumer needs – some of which may be latent. Another key element of consumer-centric innovation is determining which of these comments or ideas companies should listen to and act on. The excessive amount of consumer-generated content available online can be daunting; companies need precise filters and good data analytics to make sense of what otherwise can only be viewed as noise. The time when one could keep up with the information on the World Wide Web is already ancient history. With the Web growing dramatically, it becomes impossible to track even a small and well-defined segment of the Web. Therefore, the company marketer has even more difficulty finding the information he or she seeks (Aaker et al., 2000). To cope with these practical problems, the company can turn to netnographic methods. *Netnography* (Kozinets, 1999;2002) originated from ethnography. Netnography uses information publicly available on the Internet to study the culture, nature and behavior of online consumer groups and communities that inhabit computer-mediated environments (Arnould & Epp, 2006). The netnography approach describes how to identify and contact online communities and how to analyze and check trustworthiness of community insights. Netnography is more time efficient and less costly than market-oriented ethnography, focus groups and depth interviews. Two initial steps in preparing for netnography include: (1) designing specific market related questions; and (2) developing thorough background knowledge of appropriate online forums, the groups and individual participants they seek to understand (Arnould & Epp, 2006). Market research's utility from methods that use interviews or focus groups depends on the analyst's ability to accurately and completely condense from the interview data the product attributes consumers feel are important (Jeppesen, 2005). Another problem in interpreting market research may arise from the fact that consumers constantly form new preferences and thus may change their opinion by the time the actual product is released (Dahan & Hauser, 2001; Rosenberg, 1982). The most useful interpretations of netnographic data take advantage of its contextual richness and result from penetrating metaphoric or symbolic interpretations rather than meticulous classification as in other analysis of qualitative data (Arnould & Epp, 2006), e.g. as applied by Spiggle (1994) and Thompson (Thompson, 1997). Further, netnography covers the question how to conduct online marketing research in an appropriate, ethical way. To deal with the ethical issues, the researcher should disclose his presence and intentions to the community, ensure confidentiality and anonymity, seek and incorporate feedback from community members (member check), and obtain permission to quote from specific postings and communications (Arnould & Epp, 2006).

Referring to common ethnographic procedures, Kozinets (2002:63) recommends the following methodological stages and procedures for netnographic studies:

1. *Entrée*: formulation of research questions and identification of appropriate online forums for study;
2. *Data collection*: direct copy from the computer-mediated communications of online community members and observations of the community and its members, interactions and meanings;
3. *Analysis and interpretation*: classification, coding analysis and contextualization of communicative acts;
4. *Research ethics*: "(1) The researcher should fully disclose his or her presence, affiliations, and intentions to online community members during any research; (2) the researchers should ensure confidentiality and anonymity of informants; and (3) the researchers should seek and incorporate feedback from members of the online community being researched... (4) The researcher should take a cautious position on

the private-versus-public medium issue. This procedure requires the researcher to contact community members and to obtain their permission (inform consent) to use any specific postings that are to be directly quoted in the research" (Kozinets, 2002:65).

5. *Member checks*: presentations of some or all final research report's findings to the people who have been studied in order to solicit their comments.

Online communities are seldom representative of an already-defined target group, but as netnography is an exploratory research approach, the focus is on revealing undiscovered user needs, product ideas and potential fields for growth and innovation rather than assessing representativeness. Complementary quantitative research builds on consumer insights whereas observing the conversation in passionate consumer tribes helps generate relevant questions for the broader mass of consumers. Kozinets (1999, p. 254) recommends distinguishing between tourists, minglers, devotees and insiders when analyzing messages from online community members: Tourists lack strong social ties to the group, and maintain a superficial or passing interest in the consumption activity. Minglers maintain strong social ties, but are only perfunctorily interested in the central consumption activity. Devotees maintain a strong interest in the consumption activity, but have few social attachments to the group. Finally, insiders have strong social ties to the group and maintain a strong interest in the central consumption activity. Kozinets (2002, p. 64) highlights devotees and insiders – i.e. the most enthusiastic, actively involved and sophisticated users – as the most important data sources.

As Kozinets notes, netnography is "based primarily on the observation of textual discourse" (2002:64) and states that content analysis is used to expedite the coding and analysis of data. Hence, any trained communication scholar who is familiar with the rich tradition of methods for the analysis of textual discourse might wonder why the study of textual discourse on the Internet should be classified as a (quasi-)ethnographic method. Without denying its ethnographic relevance, it appears even more legitimate to classify or position content analysis of online communication in between discourse analysis, content analysis, and ethnography. Content analysis itself is already a well-established method in communication and media studies in its own right with a more than 70 years old tradition. Originally applied to traditional mass media texts (such as texts and shows in newspapers, on radio or TV), there is no reason not to apply it to the Internet as well.

## Appendix F. Online innovation communities

Chan and Lee (2004) provide the following table in which requirements for participation of online community members is also explicated.

Community Characteristics		Virtual Community Community	Beta Testing Volunteer Corps	User Content Collaboration Innovation Community	User Development Community	User Product Collaboration Innovation Community
Characteristics of Community Participants		General Users	Early Adopters	General Users	Innovators Early Adopters	Innovators Early Adopters
User Interaction Level	Information/ Knowledge	Consumption Information/ Technology Information	Consumption Information	Content Information	Tehnology Information	Technology Information/ Technology Knowledge
	Link	√	X	√	√	√
	Innovation	X	X	√	√	√
	Collaboration	X	X	√	X Independent Creation	√
Interaction between community participants	Long Time	X	X	√	√	√
	Guidance	√ Manufacturers	√ Manufacturers	√ Manufacturers	√ Manufacturers	X User Community
	Participation Model	Consultancy Mode (Dialogue)	Consultancy Mode (Dialogue)	Apprenticeship Mode (Creation)	Apprenticeship Mode (Access)	Apprenticeship Mode (Experiment)
Phases Involved in Product Development		Launch	Testing	All stages	All stages	All stages
Cases		Amazon.com	B-site test before Microsoft was sold in the market	Open Directory / Slashdot.org	PalmPilot / GE Plastic website	Linux / Mozilla / Sun's OSS projects

**Table 12-1: Classification of user communities' participation in new product innovation (Chan & Lee, 2004)**

In this Table 12-1 the following definitions for the several terms are used:

- *Characteristics of Community Participants* are categorized according to Rogers' (Rogers, 1995) categories innovators, early adopters, early majority, late majority and laggards.
- *User Interaction Level*, categorized in:
  - o the type of knowledge shared in the community, i.e. technology knowledge, technology information, consumption information, and content information;
  - o the presence of formal ties or links, resulting in a √;
  - o the occurrence and suitability for innovation
  - o the occurrence of collaboration between communities
- *Interaction between community participants*, judged by the factors:
  - o Long time when the period of joint work during the whole product development is long
  - o Guidance, divided in manufacturer's and community's guidance / authority
  - o Participation model, based on Leonard-Barton's (Leonard, 1999) classification of user involvement, i.e. delivery mode, consultancy mode, co-development mode, and apprenticeship mode.
- *Phases Involved in Product Development*, designating the innovation process phase most suitable for this type of community.

The five described community models are (Chan & Lee, 2004):

1. Virtual customer community: This community is a virtual community composed mainly of customers who had experience in using products. Key participants in the community cannot clearly classify it into any category under Rogers' (1995) classification. Therefore, community participants in this model are all called general users. Most users in this community possess the same interests and experiences. They get together to chat online or exchange personal experiences and side news through bulletin boards, and comment on products and services. The development of this type of community came mostly from voluntary gatherings of users. However, in recent years, manufacturers have realized the tremendous value and benefits that the discussion contents, personal attitudes and behavior of members of the virtual communities bring to marketing. Therefore, many business web sites have started to aggressively operate this type of virtual communities to obtain benefits from them (Hagel & Armstrong, 1997). The creation content of this community is accumulated gradually. Its value is that it is a group experience and develops points of view generated from verification and comparison. It is different from the creation content that has themes and organizational structure. This type of creation content is helpful in the areas of the spread of reputation, products and service support, users' hidden behaviors, and the understanding of demands. Therefore, managing this type of community is beneficial for performing service support and marketing activities (such as market evaluation studies and promotion activities) during the product development stage. This stage is defined in this plan as the marketing stage. The participation model of this community belongs to the consultancy model. Manufacturers increase mutual understanding and knowledge sharing through dialogue. The time spent on interaction between the community participants and the manufacturers is not long. The community organization is mostly non-structured, and mostly does not affect the operation of the original organization structure. In addition, the formation of this type of community is mostly initiated by manufacturers, and its operation, such as the limitation on members' qualification, the encouragement policies, and the operation rules, is guided by manufacturers.
2. Beta Testing Volunteer Corps: It is common in the software industry to employ early adopters as subjects to perform prototyping and testing. Early adopters like to investigate the breaking through ability that new technology brings, and their participation motivation is to know the most advanced technology. In the early days, there was no specific community web site for community participants to communicate with each other. The communication was mostly through the customer service centers or the web page provided by the company, and the participants reflect trial condition, in one direction, to the company. The contact between communities was nothing but sporadic discussion occurring in the discussion section on the web. The participants seldom formed regular communities. They normally interacted directly with manufacturers, and there were no innovative activities between the members in the communities, not to mention creation of the collaboration interaction model. In addition, community members only interacted intensively with companies during new product testing period. There are not many interactions at other times, and the testing activity and the follow-up analysis are mostly performed and organized by companies. However, in recent years, companies have also utilized the distribution of trial versions or testing software to enhance their reputations and to increase market shares. They have also started to establish designated web sites to provide to web users for downloading and communicating and interacting with other users. Compared with other communities, the connection level between members in the community is not very strong.

3. **User Content Collaboration Innovation Communities:** The user content collaboration innovation community is a model of a volunteer community of collective creation and compilation through networks. Because the content material of the creation does not involve difficult technology knowledge, whoever is interested may join the creation line. There are no obvious differences between users. The establishment of the community web site may be voluntary, such as the collaboration of "steam bun and noodles" which is famous in the Taiwan networks, or it may be initiated by business organizations, such as the open directory by Netscape and the Slashdot.org by Yahoo, which is a web site for news. In addition, we may find that user content collaboration innovation communities initiated by business organizations all have strict quality control and filtering processes.
4. **User Development Communities:** User development communities are formed mainly by innovators and early adopters. These communities perform mainly product innovation activities such as development and design. Innovative products are mostly for personal use or to be distributed for other people to use, in limited forms such as fee collection or trial usage. Each innovative product is completed independently by developers and no collaboration is required during the innovation process. There are designated web sites where the communities gather, and members of the communities spread distribution products and exchange usage feelings through the web site. Communities will also exchange ideas about the technical problems that they encounter during the creation process. However, the exchange is mostly on technology information, but not on technology knowledge at the level of intellectual property. Some user development communities are formed voluntarily by communities and some are established by companies. Business companies' intention is to cultivate the development of communities through constructing community web sites, holding technology seminars, providing development tools, and providing encouragement rewards. As for business companies, the operating user development community may allow users to develop the products they need, as in the case of the GE plastic web site (Thomke & von Hippel, 2002) or they may allow the development of supplementary products that are appropriate for the company, further strengthening the company system structure to increase the external value of the users' network, such as the software development community operated by PalmPilot.
5. **User Product Collaboration Innovation Communities:** User product collaboration innovation communities are formed mainly by innovators and early adopters. These communities consist mainly of a group of technology enthusiasts in the hacker level who are responsible for product development. The characteristics of these communities are, employing separate groups, connecting separate resources through the Internet, transmitting fragment knowledge through knowledge sharing and constructive criticism, and simultaneously testing and designing products. These communities exhibit fast development, new added functions, and revision of pre-existing errors. Communities may obtain profits from the creativity and the cooperative behavior of a group of numerous developers because they may gather the collective wisdom of thousands and millions of network elite, may simultaneously study multiple resolutions of a problem, and may finally select the best case, through parallel processing by colleagues. It not only saves costs, but also enhances efficiency. Because users are innovation contributors, they understand their own needs and they respond hastily and provide their contribution. Besides exchanging technology problems encountered in the creation process, communities also exchange technology knowledge involved at the level of intellectual property. In addition, intellectual property is not controlled by one single entity. There are voluntarily formed user product collaboration innovation communities. The most famous one is the

operation model in the Linux community, which is the model example of the operation of a community. User product collaboration innovation communities may also be formed by business companies. The most famous one is the release of the source code of Communicator 5.0 by Netscape. After that, Sun, IBM, HP, and RealWork all had the plan to release source code, the result of R&D. The reason why these companies aggressively fought for the release of original codes was to obtain the input from the research and development of original code communities. They hoped to build another successful legend like Linux with the strength of the open source software community. Regardless of whether the communities are formed voluntarily or for business, their control mechanism is more open. Even business companies cannot completely guide them because whether the user product collaboration innovation communities that are originated by business organizations may exist smoothly totally relies on the continuous innovation of the community. Therefore, most organizations operate these communities through close connection and interaction and follow the operation norms of the communities.

## Appendix G. Common, universal language: metaphors and analogies

### Justification for a common language

As we have seen in 4.7.6a particular problem in the Co-design approach is the language to express ideas in. Lundkvist & Yakhlef (2004) also argue that there is a general need for a common language and a common approach to the collaboration with the customer, which first of all requires an understanding of the "other" as somebody who has got something to contribute. Almost all research on customer involvement omit giving tools or methods to overcome interaction difficulties such as the language gap between customers and companies (Camarinha-Matos, 2009).

When thinking about something new, one needs a way to talk about something that doesn't exist. Traditional language is then often cumbersome, complex and inadequate for this purpose (de Bono, 1998). In general, an often encountered problem in the communication between customers and their providers of products or services is that what the one says is not properly understood by the other, because of technical jargon. For any real innovation to be co-created, all the members of the company and participating customers must have a shared framework and a common understanding of the innovation problem to be solved (Winsor, 2006). Generative tools can be used to create a shared design language in which people can express an infinite number of ideas (e.g. dreams, insights, opportunities) through a limited set of stimulus items (Sanders, 2006). Metaphors are an element in a design and development language as well as creative activities that meet these requirements (Albinsson, 2005; Kozinets, 2002; Runco, 2004). Similar observations can be made about analogies.

### Metaphors, similes and analogies defined

According to the Oxford English Dictionary a metaphor is "the figure of speech in which a name or descriptive term is transferred to some object different from, but analogous to, that to which it is properly applicable". A metaphor involves understanding and experiencing one thing in terms of another (Lakoff & Johnson, 1980); it is the perception of one thing as if it were a different kind of thing (Zaltman, 1997). Metaphors involve the transfer of information from a relatively familiar domain (variously referred to as source or base domain, or vehicle) to a new and relatively unknown domain (usually referred to as target domain or topic). A simile is a comparison of one thing with another: organization is like an organism. Similes involve explicit comparison. From a cognitive point of view similes can be treated as metaphors (Tsoukas, 1991). An analogy operationalizes a metaphor or a simile by focusing on relationships between items. The defining characteristic of analogical reasoning is the transfer of an explanatory structure from the source domain to the target domain. E.g. "a puppy is to a dog like a kitten to a cat", "electrons are to the nucleus what planets are to the sun". Metaphors, similes, and analogies, more than literal assertions, do not simply describe an external reality; they also help constitute that reality and prescribe how it ought to be viewed and evaluated. Metaphors also allow "inferences to be made about one of the things, usually that about which we know the least, on the basis of what we know about the other" (Tsoukas, 1991).

### Metaphors in innovation context

Metaphors are very useful for social sciences, because its subject matter has a more vague and less solid character than natural reality; they make reality more palpable and comprehensible (Tsoukas, 1991). This explains why social science metaphors tend to be of a pictorial nature invoking images rather than pure constructs or abstract symbols. Metaphors are a better alternative to express the continuous flow of experience. By



contrast literal language has an inherently reductive propensity. Metaphors are therefore useful in generating or acquiring knowledge.

The use of metaphors seems to be an unconscious and integral part of human communication (Lakoff & Johnson, 1980). According to Gibbs et al. (2004) metaphorical thought and language arises from, and is grounded in, embodied actions and experience. Zaltman and Coulter (1995) and Zaltman (1997;2003) observe that metaphors are key windows or mechanisms for viewing people's thoughts and feelings and for understanding behavior, and they also actively create and shape thought. Our senses provide important metaphors, making it possible to have people represent their thoughts through images, scents, taste and other sensory experiences which represent attitudes, emotions, actions, goals, personal values, and experiences with e.g. products and services (Christensen & Olson, 2002).

Metaphors are important when talking about new things in terms of older things, which makes them popular among IS developers, poets and other people struggling with innovation (Albinsson & Forsgren, 2005). Recently, metaphor use has also caught the attention of marketing and product development professionals (Zaltman & Zaltman, 2008). Teichert et al (2006) postulate that metaphors promise great potential for enabling and studying preference formation under uncertainty, and posit that metaphor can serve multiple, yet unexplored, roles in NPD and market making. They distinguish three (3) roles for metaphors in NPD:

- **Role 1: Mental Model Communication:** Metaphors are used as communication tools to convey meaning in external marketing campaigns. This role is most appropriate when preferences for products, and market narratives about products and product categories, are already well established. Concerning NPD processes, it is applied during the later stages of the process (i.e., the commercialization of a new product).
- **Role 2: Mental Model Matching:** Metaphors are used as a shaping device to overcome producers' internally entrenched perspectives or inertia as they seek to elicit and match (and possibly influence) already largely formed mental models of consumers. In this way, they help shape the early trajectory of an NPD project, from product ideation through pre-production.
- **Role 3: Mental Model Creation:** Metaphors are used as cognitive exploration devices in the creation of new mental models of a product category or an emerging market, serving as vehicles for mutual understanding during the interactive definition of a dominant design among producers and customers. From a producer's perspective, this role is relevant during the entire NPD process. In the early stages of an NPD process, metaphor may enable collective sense making among producers and consumers by juxtaposing known product concepts with not yet connected knowledge domains, something that can prove important for the range of product features. In late stages of NPD, mental model creation enhances the chance that a product will be chosen as, or be in line with, the dominant design in a product category.

Of the above mentioned three roles of metaphors, their use in mental model communication occurs furthest downstream in NPD processes. This is the role that is most readily understood and documented, as it is the one most commonly used in everyday marketing practice. Since the basic direction of an NPD project's trajectory is determined in the early stages, it is important to draw on metaphorical producer—customer interaction techniques before a product is developed and fine tuned for later market introduction. As such, a first and central claim of our argument is that the use of metaphors should not be restricted to late NPD stages, or already established markets or product categories. Rather, it may be envisioned as a sort of process for connecting the three roles introduced (Teichert et al., 2006:459).

## **Analogies in innovations**

The design and marketing literature suggests several strategies for generating new product ideas, including such techniques as benchmarking (Ulrich & Eppinger, 2000), user observation, e.g., empathic design (Leonard & Rayport, 1997), lead user analysis (von Hippel, 1986), and analogical thinking (Srinivasan et al., 1997). Of these techniques, analogical thinking has the greatest theoretical support as the driver of truly innovative and creative thought (Boden, 1990; Gavetti & Rivkin, 2005; Gentner & Markman, 1997; Roukes, 1988). Analogical thinking is considered a key source for radically new ideas (Lettl et al., 2006a).

An analogy is a fundamental cognitive mechanism to retrieve existing knowledge and to apply it in a new context (Herstatt, 2008), and can be called the recombining of existing innovations (Hargadon, 2003). Researchers in cognitive psychology generally agree that creativity consists of reassembling elements from existing knowledge bases in a novel fashion to produce a new idea (Gagne & Shoben, 1997; Ward, 1994). Analogical thinking has been proposed as a basic mechanism underlying creative tasks, in which people transfer information from familiar, existing categories (i.e., base domains) and use it in the construction of their new idea (i.e., the target domain) (Finke et al., 1992; Gentner & Markman, 1997). Evidence from the problem-solving literature suggests that people confronted with a creative task search through a "space of possibilities" in memory (Newell, 1990), hoping to access useful information. This search process is described in the analogical transfer paradigm as the access stage, the first step in analogical thinking. The goal of the access stage is to activate information in one or more existing base domains (Gregan-Paxton & Roedder John, 1997). When the information is accessed, people can map the similarities between the base and the target domains and transfer existing knowledge to the target. In following these steps, people can borrow both attributes and relations from existing base domains and use them in the creation of a novel target (Dahl & Moreau, 2002). Practitioners in new product development recognize the importance of analogical thinking and actively encourage the use of multiple analogies in generating new product designs (Goel, 1997). For example, IDEO, a product design consulting firm, uses formal brainstorming sessions to encourage design team members to access diverse knowledge bases during idea generation (Hargadon & Sutton, 1997). The firm believes that the more knowledge bases accessed during the design process, the more original the product will be. Other practitioners also promote the use of multiple analogies during creative tasks. Sarlemijn and Kroes (1988) encourage the use of both functional and form analogies. Similarly, Gordon (1961) advocates the use of personal, direct, symbolic, and fantasy analogies in the synectic approach to design.

Analogies can therefore be used systematically in the early innovation phases of new product development and which factors influence the successful use of analogical thinking in innovating companies (Chang, 2008; Schild et al., 2004). Gick and Holyoak (1980) also elaborate on the power of analogies for solving problems. Although these studies have proposed better methods for product design and development, their contributions are limited primarily to straightforward design tasks such as product redesign and the development of incremental innovations. Little, if any, attention has been focused on the methods and cognitive processes that underlie the creation of more-original ideas and products (Marsh et al., 1999) that would defy straightforward classification into any existing product category (Gregan-Paxton & Roedder John, 1997). As far as analogies seem to have a greater potential to enhance creativity compared to near analogies, breakthrough innovations are more likely to result from far analogies between distant domains (Dahl & Moreau, 2002). Analogies can also be used in concept testing. This method uses the historical data of similar products to assess the success of a new product. Assuming that the environment stays stable, analogies can answer two important questions once they are identified. First, they can be used to predict the performance of a new product in terms of awareness, trial, repeat purchase, and market

share. Second, analogies can help companies determine the approximate marketing effort required to achieve a similar level of performance. This, in turn, helps companies position their new products (Ozer, 1999). Finally, analogies can also support the diffusion process by increasing comprehension of the new product through one or more analogies (Heath & Heath, 2007).

### **Synthesis: using metaphors and analogies to support customer involvement**

Existent literature about analogical reasoning in early new product development stages (Dahl & Moreau, 2002) seems to be closely related to the role of metaphor during the entire new product development process. Two fundamental differences apply here, however: (1) metaphor goes beyond analogical comparison, and (2) previously analogical reasoning is studied as a creativity method from an internal perspective only (Teichert et al., 2006:459).

We therefore propose three roles of metaphors and analogies in NPD, each focusing on a different aspect of the innovation process, in which the customer is involved: (1) to communicate with customers in general, whether this is in the needs assessment or in the commercialization stage of the innovation; (2) in the design process to come to and communicate creative solutions for the innovation problem; and (3) to support communication within a NPD-team, of which customers can be a part.

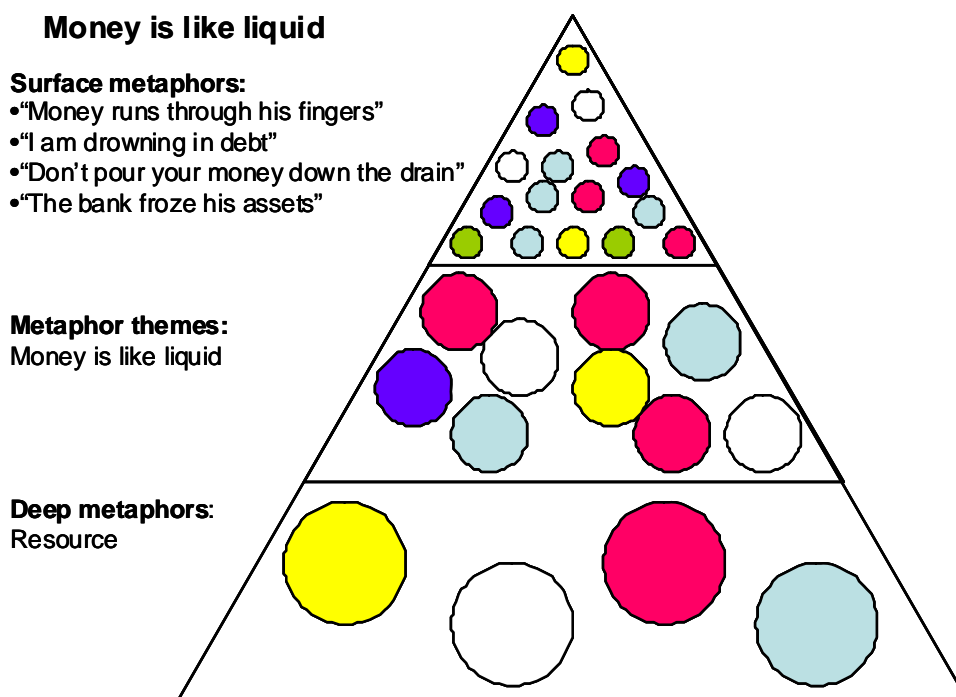
#### ***Communicating with the customer***

A problem that emerges when involving customers in the innovation process is that, from the manufacturer's perspective, customers seem to be unable to articulate their needs or express their requirements for a new product. This particularly takes place in the needs assessment stage of the innovation process. But, as for other situations, e.g. during product use and encountering problems or anomalies, customers can experience significant problems in making clear to providers' customer service what they really experience. Companies therefore 'force' customers to submit questions, complaints and such in formats, designed from manufacturer's perspective, often confusing customers, resulting in the abandonment of the complaints process. Signaling metaphors and understanding their meaning can alleviate this dilemma.

The position that thinking is represented primarily through metaphors is consistent with the interactionist view that the creation of new thoughts is shaped by metaphors (Zaltman, 1997). So basic are metaphors to the representation of thought that communicators and audiences alike often are unaware of their use and therefore of the significance of metaphors in the creation and expression of thought. Metaphors not only help us make sense of what we perceive, but also direct our attentional and perceptual processes (Zaltman, 1997). The process of imagining, that is, creating or arriving at what it is we know, shapes the content of knowledge. "Without imagination, nothing in the world could be meaningful," observes (Johnson, 1987:ix). "Without imagination, we could never make sense of our experience. Without imagination, we could never reason toward knowledge of reality." Metaphors are central to imagination (Goldman, 1986). Without metaphors we cannot imagine: they are the engine of imagination (Zaltman, 1997). Metaphors have the power to trigger perceptual shifts in our understanding of a given knowledge domain; further, they enable the succinct transmission of a large amount of information simultaneously at a cognitive, behavioral, and emotional level. As such, it does not come as a surprise that metaphors have been previously introduced in the marketing discourse as superior instruments for eliciting customer preferences for already existing products, and for enhancing the cognitive 'aptness of marketing campaigns with respect to customers' mental representations of products (Zaltman, 1997; Zaltman & Coulter, 1995).

The concept of *a live communication* focuses on the dynamically changing aspects of communication. From the perspective of aliveness, no two instances of a facial expression or gesture are completely alike as is the case with traditional concepts and methods from the study of communication; these are relatively static and based on the metaphor of signal and response. Although authors elaborate on this new concept in the context of child and infant development, they claim that it is applicable at any age, in any species, between species, in any form including time-delayed practices using written symbols, and with non-living objects (Fogel & Garvey, 2007).

Metaphors are acquired through a socialization process, so that, at some level, their meaning is shared within a culture or community. These are called *deep metaphors* and give guidance to patterns of behavior and perception of others (Zaltman & Zaltman, 2008). Although individuals may use different *surface metaphors* in their everyday language, below this expressed level the underlying deep metaphors are usually the same (see Figure 12-2). Thus, metaphors are especially important for eliciting a mental model shared by a market segment or group (Zaltman & Coulter, 1995).



**Figure 12-2: Surface and deep metaphors (Zaltman & Zaltman, 2008:xvii)**

Based on the premises defined earlier (see list above) the Zaltman Metaphor Elicitation Technique (Zaltman, 2003; Zaltman & Coulter, 1995) was developed to specifically elicit these hidden thoughts and feelings that people ‘store’ in metaphors and stories in order to understand the drivers of behavior.

Cameron et al. (2009) describe how discourse analysis is conducted by identifying linguistic metaphors, coding them and finding patterns of metaphor use to uncover people’s ideas, attitudes, and values → this is called Metaphor Led Discourse Analysis (MLDA). MLDA can be applied to any social science issue, to groups or individuals.

Definitions: Linguistic metaphor: refers to metaphors in language use, in contrast to metaphors in thought. In this work it does not refer to linguistic instantiations of conceptual metaphors. Conceptual metaphor: metaphors conceptualizing phenomena in

society or culture. An important observation about conceptual metaphors is that many of their source domains reflect significant patterns of bodily experience (Gibbs et al., 2004). For instance, the way we talk about life or love as a kind of journey refers to the very embodied experience of people moving from some starting point, along a path, to reach, or attempt to reach some destination.

In an interview with Sloan Management Review (Sloan Management Review, 2009), Dan Ariely postulates that when introducing or selling a new product, firms should compare the new product with something that the customer is already familiar with, because new products are hard to value in isolation, and because people fall back on habit, relying on past decisions. Comparing a completely new product could pose a problem to this way of introduction. The use of analogies, i.e. presenting an analogy for the new product or service, is a way to deal with this problem.

As for online communication, the most useful interpretations of netnographic data take advantage of its contextual richness and result from penetrating metaphoric or symbolic interpretations rather than meticulous classification as in other analysis of qualitative data (Arnould & Epp, 2006), e.g. Spiggle 1994 (1994) and Thompson 1997 (1997).

### ***Metaphors and analogies in ideation and design***

Unfortunately, by applying metaphor only for eliciting given preferences, the constructive potential of metaphors remains untapped. Furthermore, the current focus on metaphor's role in NPD is restricted to late stages of the development process (Teichert et al., 2006:453). Because metaphors reveal our thoughts, and shape them as well, metaphorizing may even be the central or most elemental creative force of the imagination and hence can be a source of ideas (Zaltman & Coulter, 1995). Using deep metaphors as a viewing lens for consumer insights, needs or even problems is a means to come with ideas for meeting these needs or solving the problem (Zaltman & Zaltman, 2008). In their book Zaltman and Zaltman give numerous examples where using one or two deep metaphors to develop new product ideas, position new products, reposition existing products, develop advertising messages and campaigns, and such, showing that this approach could be valuable for marketing managers. They also suggest some seven important questions managers should address when immersing in the process of using metaphors for idea generating (Zaltman & Zaltman, 2008:190-194). Generative metaphor is a vehicle whereby learning is suddenly transferred from one area of strength to an area of difficulty, enabling problems to be solved without direct engagement with the problems. A metaphor is generative to the extent to which it serves to break the hammerlock of the status quo, serves to reorganize perceptual processes and ingrained schemas, helps positive and compelling new images of possibility, and serves as a bridge for non-defensive learning among new contexts (Barrett & Cooperrider, 1990).

Stein (1983) points to the role of metaphors in the creative process by citing a number of innovations whose creators got an idea by seeing a problem in metaphoric terms, e.g. Bell's using the structure of the inner ear for a telephone. Good metaphors provoke new thought, excite us with novel perspectives, vibrate with multi-vocal meanings, and enable people to see the world with fresh perceptions not possible in any other way (Barrett & Cooperrider, 1990). Recognizing metaphors is also a useful way to discover new ideas (Chang, 2008). In designing it is important to "translate" users' language and wordings in design requirements. Metaphors can bridge this translation as is the case in Kansei-Engineering (Guerin, 2004). Metaphor facilitates the learning of new knowledge, when confronted with radically new knowledge (Barrett & Cooperrider, 1990).

We posit that use of metaphor during the concept stage of the NPD process can lead to identification of ideas with high or even disruptive potential. The use of metaphor as mental model creation tools in early stages of NPD helps crystallizing dominant designs;

i.e., dominant product architectures with the strongest market appeal for a critical mass of customers. Thus, metaphors may be conceived of by producers early in NPD, and used in later stages of NPD to influence customer mental models via means of market stories (Teichert et al., 2006:457).

Indurkha (Indurkha, 2007) asserts that metaphorical reasoning (and analogies) can sometimes lead to rational conclusions and sometimes not. He distinguishes two modes of reasoning with metaphors, the monotonic or similarity-based metaphors, and the non-monotonic or similarity-creating metaphors. Non-monotonic metaphor reasoning is in his view an indispensable aid to creative problem-solving, by 'making the familiar strange', i.e. abandoning existing analogies and creating new ones, e.g. in another domain. Similar findings on analogies were identified by Dahl and Moreau (2002), who assert that far analogies result in more creative solutions

Several procedures and methods exist which can be used to generate innovative ideas for product concepts based on analogies and metaphors. Such methods include synectics, the lead user approach, TRIZ and bionics (Schild et al., 2004). Two approaches to incorporate analogies into the lead user method exist. First, the company can look for analogue areas and involve lead users from these analogue markets into the innovation process. Second, lead users from the target market can be very helpful in identifying relevant analogue search fields. As Lettl (2004) has observed in a number of case studies in the medical field, lead users often take knowledge from analogue fields to develop their product concepts. In a way, lead users are more open to analogue fields than the manufacturers of the products. Herstatt and Kalogerakis (2005) also provide a systematic method of applying analogies in innovations. A key problem in using analogies for problem solving in innovation projects is to find relevant analogies early in the process. Especially far analogies are hard to retrieve, because they usually lack surface similarities that would facilitate their retrieval (Schild et al., 2004).

Special attention has to be paid to organizational facilitators and the requests on people involved in this process. It seems likely that the use of analogies in the innovation process depends on the existing knowledge of the involved persons (Schild et al., 2004). Experience and knowledge of the team members that is used to search for analogies can stem from diverse sources, such as former development projects, other knowledge sources like hobbies, general education or an inspiration of the direct environment of the developers, and the use of personal networks: experts within or outside the company (Herstatt, 2008). To activate this knowledge Herstatt (2008) suggests to use mostly brainstorming or other creativity techniques (e.g. 6-3-5 method) under a given time frame, and to discuss the diverse ideas within the team. Hargadon and Bechky (2006) also suggest to make use of collective or group creativity through brainstorming to find distant analogies, that the individuals alone could not generate.

### ***Metaphors and analogies as a communication tool in teams***

Recent research has highlighted the effectiveness of using metaphor and analogy as a way of communicating a guiding vision in an almost subliminal manner, so that much of its significance is tacitly understood (Leonard & Sensiper, 1998). Metaphor and analogy enable team members to free-associate and "dream" of an ultimate design that captures the essence of a guiding vision, rather than simply following explicit specifications (Hargadon, 1998). Metaphor invites active experimentation in areas of rigidity and helps people overcome self-defeating defenses, and provides a steering function for future actions and perceptions. Fresh insights are transferred instantaneously, almost unconsciously, bringing about semantic and perceptual changes (Barrett & Cooperrider, 1990).

However, metaphors and analogies can be confusing, if not properly explained and communicated with affected persons. For instance in early days of web design, graphic designers would use "brochure" and "page" metaphors based on their experience from design of paper artifacts. IT people would use "database" and "program" metaphors based on their experience with PCs. Last but not least "management" people would use "marketing campaign" and "store" metaphors based on traditional business. In a way this situation, when different metaphors are put forward as the best solution, can be described as a war between metaphor camps (Albinsson & Forsgren, 2005).

Sifonis et al. (2006) provide a seven step approach for using analogies in innovations, resembling Herstatt and Kalogerakis' (2005) approach, but with an emphasis on the communication of the results with decision makers and customers. The communication is directed at an understanding of the innovation by all stakeholders, preventing creative blocks, and maintaining a focus on the innovation goals. The process gives us a useful basis for the support of the communication process within the NPD-team, in which customers take part.

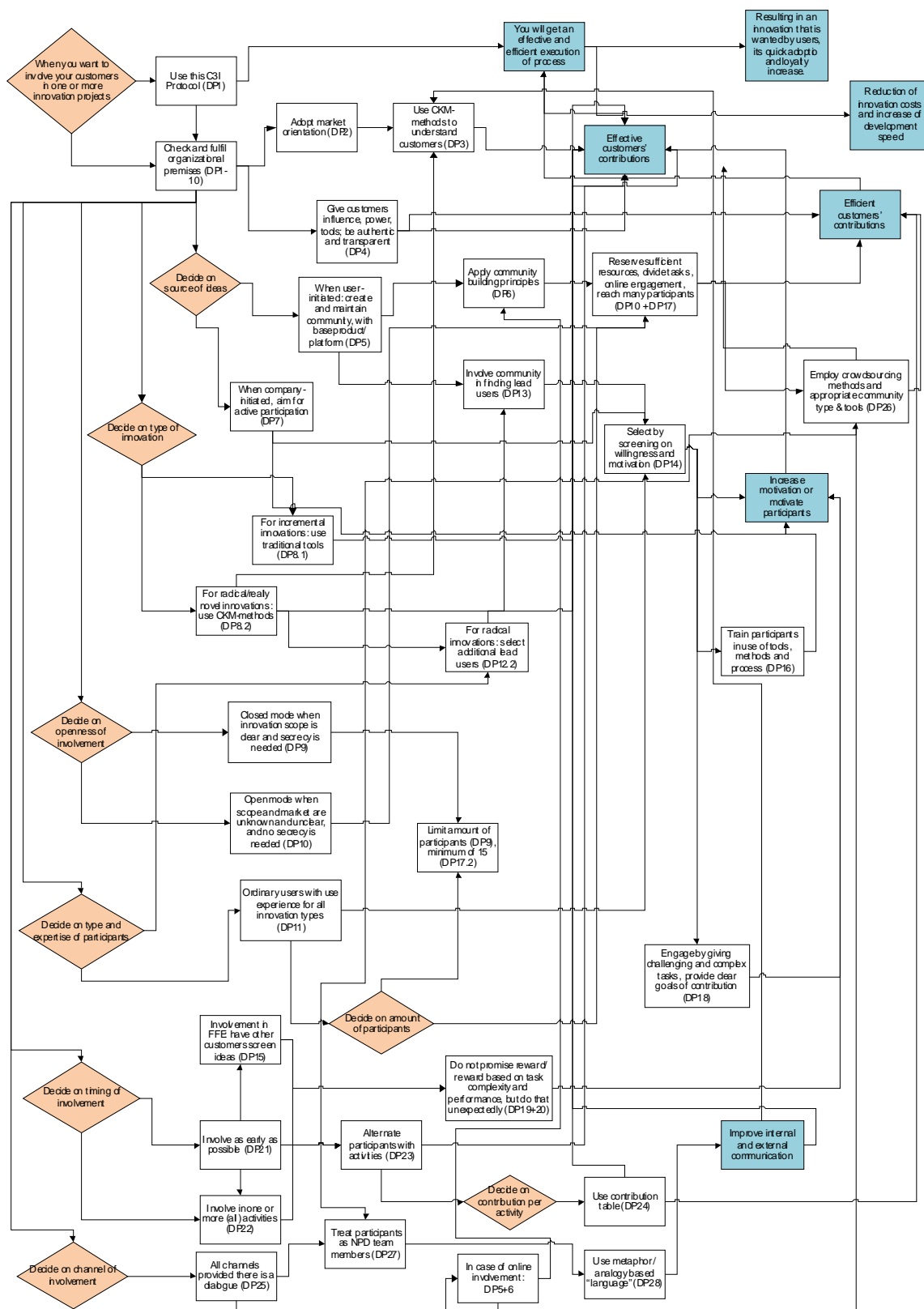
To sum it up, positive effects on the use of analogies for breakthrough innovation can be expected by fostering inter-disciplinarity within the organization. In addition, the cultivation of expert groups that are linked by knowledge brokers seems to be a success factor. If everyone tries to know everything in the company knowledge gaps as potential for innovation get lost. Besides, separated communities of practice that do not interact hinder the access to analogies and therefore to innovation as well. And finally, face-to-face communication is important to link separated groups and cannot be substituted by technologies like the intranet (Herstatt, 2008).

## Appendix H. Design propositions in CIMO, schematic representation

Two representations of the 28 design propositions are presented in this Appendix. The first figure, attached as a separate large format (A3) page to this thesis, is an overview of all entailments of these propositions and their relationship, i.e. all Context-, Intervention-, Mechanism- and Outcome- diagrams are represented. The coding and coloring is as depicted in the legend at the top of the diagram. This diagram demonstrates how all 28 design propositions are inter-related.

The second diagram is an aggregation of the first where mechanisms have been omitted to amplify the interrelationship of the interventions. Also, the context-situations are represented by decision diagrams (orange-colored diamond shapes). Outcomes are represented by blue-colored boxes. This aggregation was made to simplify the quite complex diagram of all CIMO-diagrams explained above.





## Appendix I. Questionnaire for the protocol reviewers

This appendix presents how the protocol has been validated. It contains the instructions to the reviewers and an additional list of questions.

Dear ...,

Thanks for showing interest and willingness in reviewing my protocol for involving customers in the innovation process of a firm. By reviewing it, you are helping me to validate this design for practical use.

Attached you will find the two relevant chapters from my (draft) dissertation and the appendices that are referred to in these chapters. You will see that Appendix H (Design Propositions in CIMO, schematic presentation) contains a very complex and probably difficult to read diagram. I don't expect you to study or review this, but any comments or suggestions on a better presentation are welcome. I am searching for a better way of presenting it. You'd be more interested in the aggregated diagram presented in Figure 56 on page 322, where design propositions, routes and all premises and considerations are integrated in one diagram. Neither do I expect you to read or consult all the references, provided in Appendix I. You may already know some of these readings, but regard the list as a means to check my assumptions, conclusions and propositions.

Below I provide some review questions, for which I am seeking the answers. You can use this questionnaire as guideline for your review. Please read these questions before starting to give feedback; they might help you to focus. I don't expect you to answer all questions individually; if there are no comments on a question, and you agree with what the protocol provides in that respect, you may skip answering the question. However, if you have any comment, please submit this. This can be done in either English or Dutch, whichever you prefer. You can do that by typing in your comment following the relevant question, save the document under an appropriate name, and send this back to me via email. But you can also choose to plan a phone call with me, and we will have a verbal feedback session. Just let me know via email when you intend to do that last option along with some preferred time slots to do so. I'll provide the contact data and plan a date and time for the call.

Should you have any more questions regarding my request and expectations, please be free to get in contact with me doing so.

Would it be possible to provide your feedback before September 15?

Good luck and all the best. Also many thanks, again,

Marcel Weber

My questions:

### **1. Design requirements**

1.1 Do you agree with the stated design requirements?

1.2 Which design requirement(s) do you miss?

### **2. Design propositions**

2.1 Are the design propositions comprehensive? Which one(s) not?

2.2 Do you agree with them?

2.3 Are all these propositions incorporated in the protocol?

2.4 Are these propositions needed to understand the protocol?

2.5 Do you miss any proposition, necessary for an effective and efficient execution of 3CI (customer involvement)?

### **3. Protocol in general**

3.1 Does the name 3CI (C-triple-I, which stands for Customer co-creation in innovation) appeal to you and potential users of this protocol?

3.2 What other name(s) do you suggest?

3.3 Is the protocol robust enough? In other words, do you think that protocol users of all sectors will be able to apply it?

3.4 Is the protocol comprehensive enough?

3.5 Does it cover all necessary elements and aspects to properly apply 3CI in your or your clients' firms?

3.6 Does it comply with your expectations? In other words, does this protocol resemble what you have expected or should expect?

3.7 Any (other) suggestions regarding the protocol in general?

### **4. Protocol routes**

4.1 Are the four routes comprehensive?

4.2 Do they emerge in a logical way from the design propositions?

4.3 Is the choice for one or more routes clear?

4.4 Is the relationship between the routes comprehensive?

4.5 Do you miss any route(s)?

4.6 Do you have alternative name(s) for the 4 routes?

4.7 Any (other) suggestions regarding the routes?

### **5. Structure**

5.1 Is the structure of the protocol logical?

5.2 Do you think the protocol user will have (no) difficulties finding his/her way through the protocol?

5.3 Any suggestions regarding the structure?

## **6. References / reading list**

6.1 Have you been looking for the referred literature to verify the protocol statements?

6.2 Was all literature you looked for accessible? If not, why not?

6.3 Were the references useful?

6.4 Are they necessary to comprehend the protocol? Does it make sense to provide them along with the protocol?

6.5 Any (other) suggestions regarding the structure?

## **7. Presentation and promotion of the protocol**

7.1 Aside from the dissertation, are there any other ways of promoting this protocol? For example, a blog, community, conferences, ...?

7.2 What way of promoting do you prefer?

7.3 Is it worth presenting and promoting to (potential) users?

7.4 Do you have any other suggestion(s) to better present the protocol?

## **8. Unaddressed issues and commentary**

8.1 Are there any other remarks you want to give, which are not covered by above mentioned questions?

8.2 Although I don't expect you to judge grammar and syntaxes, should you have encountered disturbing ones, I'll be grateful to get feedback on them.

8.3 Finally, would you appreciate it if I acknowledge your review in my dissertation, for example, in the Acknowledgements and an Appendix, listing the reviewers?

# 3CI-Protocol version 1.0

## Introduction

In this document we present the 3CI Protocol, the protocol for customer co-creation in innovations, after being adapted for compliance with comments and wishes from the reviewers. The protocol provides the guidelines, experience rules with do's and don'ts on how to involve your customers in your innovations. It has been developed on the basis of a thorough research in theory and practice as a doctoral research by the author. Theory in the sense that many of the propositions made are based on empirical research on the likelihood of manifesting and its explanations; practice in the sense that good practice enables us to see that societal and technological developments enable us to involve customers more directly in our business processes.

The 3CI protocol is intended for managers in organizations that have or receive responsibility for innovations (programs or projects), and who feel the desire to develop truly customer-driven innovations by involving these customers in the innovation processes. Organizations can come from all possible sectors or economies. Whether you are a manufacturer of consumer goods, a service provider for businesses, a governmental agency or department or a not-for-profit institution, you can use this 3CI protocol for this purpose. It provides the necessary actions you may have to take to make your organization or brand appealing enough to attract customers, clients, users or citizens to participate. And although we have aimed at involving the end users of your offerings, you may become aware that it can also be used for other stakeholders like employees, suppliers, and society in general, as well, provided you adapt and interpret the guidelines in that sense. But we caution you on this assumption – opening up your innovation programs to a broader audience entails more and other risks you will want to consider before taking. Consulting experts which support companies in NPD and NSD are also earmarked as users of this 3CI Protocol.

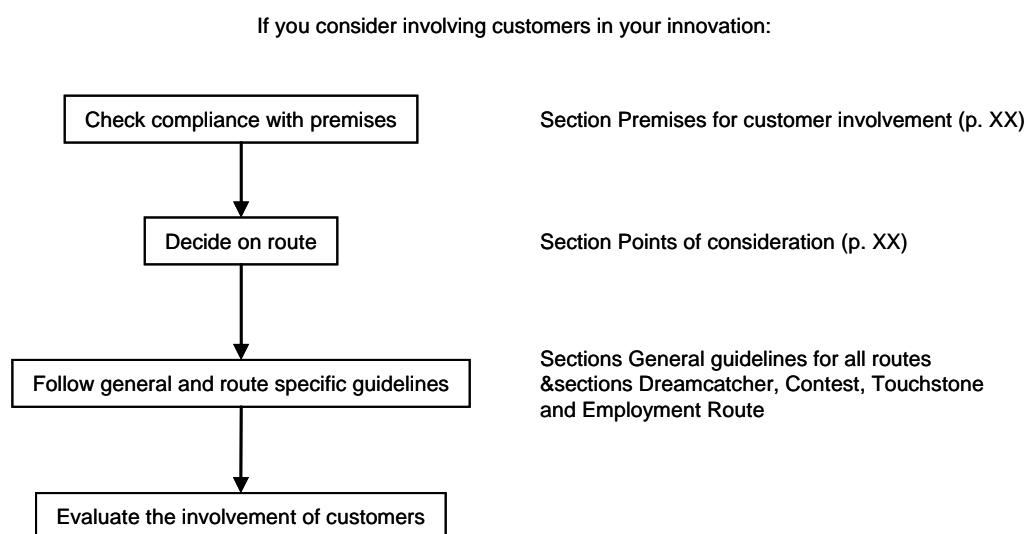
The protocol is not intended as a tight corset from which no divergence is possible. Contrary, the organization that wants to apply the protocol has certain degrees of freedom in its application. These degrees of freedom reflect decisions to be made about – assuming that the firm is customer oriented and mature enough for 3CI – the sourcing of ideas for the innovation, the type and openness of the innovation, the type and amount of participating customers, the timing of the involvement, and the channel of involvement. This freedom is reflected in the four alternative routes the organization can follow. Nor is it a procedure handbook, listing and describing tools and techniques the user can choose from. Wherever an existing method, tool or technique is recommended, we will refer to the appropriate literature. You will have to look into these references or apply for support if you want to deploy that method or tool.

The protocol is presented as an appendix to this dissertation so that it can be studied, understood and used without having to work through the vast thesis. Therefore, it can be obtained as stand alone document, which may outwardly appear different from this presentation, but which will contain the similar content. But to distinguish them from each other, we will refer to this thesis as the 3CI Protocol and to the stand alone protocol as the 3CI Protocol Lite. Because of this uncoupling from the thesis and the intended users being practitioners, references to theory are kept to a minimum. To that purpose they are mentioned in the footnotes.

The content will undergo changes as time and experience provide us with new insights. Although this thesis contains the first, formally approved version referred to as version 1.0, in the future you may encounter updated versions. To stay updated, it is advisable to register your copy so we know how and where to distribute updated versions.

We will start by giving some definitions to reduce confusion. We have to realize that many terms are used to name the phenomenon of customer involvement, but also that there are many misleading constructs that suggest the same, but have a different meaning. Next, we will provide the premises and conditions for involving your customers. We will continue by introducing the main elements of the protocol, in which four distinguishable, but closely related routes are presented, followed by a decision model to apply the best route for your purposes. Subsequently, we provide general guidelines which are applicable to all routes, guidelines per innovation stage and activity, and finally the four main routes are elaborated on. At the end we summarize the protocol with some practical do's and don'ts. The design requirements that are used as reference are listed at the end of the protocol.

For the user that wants to start immediately, the following diagram provides a roadmap on where to start and what to read in this protocol:



To support the understanding we have illustrated our guidelines with short case descriptions, added the 28 design propositions we refer to in the guidelines and a graphical representation of these propositions to visualize their relations.

## Glossary/Definitions

In every field of research definitions are important. Without definitions it is hard to measure and compare, but sometimes it is hard to give a plain definition. A classical example of vagueness in definition is the heap of sand. This is also called the Sorites paradox (Hyde, 2005). At which point does a pile of sand become a heap? Everyone can agree three grains of sand do not make a heap. But at the same time we call millions of grains a heap. This means that somewhere the pile of sand transforms from a non-heap into a heap. The precise point when this occurs is not defined and in fact does not seem possible. Defining user participation can be just as vague as the heap of sand. At what point does a user change from a non-participant into a participant? What is user participation? What is innovation? What is innovation success? Even the term "user" is open to ambiguity. What type of user are we talking about in user participation?

### *Closed mode of customer co-creation*

Closed mode of involvement stands for innovation with a minimal set of external partners – they are like private clubs, e.g. collaboration between a specific supplier and one of its customers to realize a customized innovation. The closed mode is usually followed in the

implementation stage of the innovation process, when the available resources (number of concepts, prototypes, beta test units) are limited, or the available places as a NPD team member are limited. The closed mode typically uses the physical (offline) interaction mode.

### ***Crowdsourcing***

Crowdsourcing is closely related to customer co-creation in innovations since it also involves non-professionals performing some tasks for firms. These non-professionals are referred to as a crowd, since crowdsourcing stands for outsourcing to the crowd.

### ***Customer***

Customer is the term to designate individuals or organizations that (will potentially) transact with the firm to obtain a product or service for their own use or further use by others. This means that the whole collection of existing and potential customers, existing and potential users are incorporated in this meaning.

### ***Customer co-creation***

The term co-creation refers to creativity where more than one person is involved, resulting in a product that something none of the creators could or would have achieved working alone. Co-creation does not necessarily imply the involvement of customers – the creation of a new product by two different firms is also co-creation. We will therefore avoid the use of the term co-creation, and will designate it more specifically by *customer co-creation*. Customer co-creation is the collaboration between firms and customers to create value together, rather than by the firm alone.

### ***Customer co-creation in innovations***

*Customer co-creation in innovations* is the phenomenon where companies engage in *interaction* with customers and actively involve customers in the innovation process to jointly perform innovation activities and co-create value. Active refers to the voluntary and conscious participation of the customer in innovation, in contrast with traditional market research or needs assessment where customers are passive and usually ignorant of their participation in innovation. So, it is the process where product manufacturers and/or service providers engage with their end users or customers in (parts or phases of) innovation projects with the aim of increasing effectiveness and efficiency of the innovation process. Effectiveness refers to (1) the result of meeting users' and customers' needs and demands in a better way; and (2) increasing customer loyalty. Efficiency refers to (1) the reduction of research and development costs; and (2) the reduction of development time.

### ***Customer involvement in innovations***

Customer involvement in innovations refers to the general, whether active or passive, participation of customers in innovations. The active form is what we refer to as co-creation, where customers are fully aware of their participations, its purpose and consent in participation. The passive form occurs when people are submitted to market research, surveys, product/service testing, and such, without their conscious knowing that this submission serves a specific innovation.

### ***Customer Knowledge Management (CKM)***

Refers to managing the most precious resource: the knowledge *of*, i.e. residing in their customers, as opposed to knowledge *about* their customers. Practice-based view to knowledge suggests that customer knowledge is constructed in social interaction and negotiation between people inside and outside of a company. Customer knowledge does not entail facts; rather it consists of interpretations of various people and is always open

to negotiation and dispute. By managing the knowledge of their customers, companies are more likely to sense emerging market opportunities before their competitors, to constructively challenge the established wisdom of 'doing things around here', and to more rapidly create economic value for the corporation, its shareholders, and last, but not least, its customers.

### ***Customer orientation***

Customer orientation is defined as the sufficient understanding of one's target buyers to be able to create superior value for them.

### ***Experience***

*Experiences* emerge when products and services are commoditized. An experience uses a good as a prop and services as the stage for engaging the customer in such a way that it creates a memorable event. Experiences are thus regarded as non-technological innovations of products and services, which increase the perceived value for customers.

### ***Incremental innovation***

Incremental innovations are small improvements in existing products and operations that let them operate more efficiently and deliver ever greater value to customers.

### ***Innovation***

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

### ***Innovation process model/stages***

We will use a simplified process approach that consists of four main phases. The first (Conception) of the three phases in the chain is to conceive the innovation by generating and selecting ideas; this can happen inside a unit, across units in a company, or outside the firm. The second phase (Implementation) is to convert ideas, or, more specifically, developing them into products or practices. The third (Marketing) is to diffuse those products and practices. The fourth phase is called Re-innovation, a phase distinguished and followed during the use of the initial or primary innovation, where product performance is improved during interaction with users (Gardiner & Rothwell, 1985; Shaw, 1985). In this phase we can distinguish activities like customer training, customer service, warranty and complaints handling, and maintenance or replenishment. An interesting aspect of this scheme is the suggestion that the innovation does not cease at market launch, but rather continues via a process of evolutionary development, refinements and improvements during the use of the innovation.

### ***Lead user***

Lead users are users who present strong needs that will become general in a marketplace months or years in the future. Since lead users are familiar with conditions which lie in the future for most others, they can serve as a need-forecasting laboratory for marketing research. Moreover, since lead users often attempt to fill the need they experience, they can provide new product concept and design data as well.

### ***Market orientation***

Market philosophy or orientation is an implementation of the marketing concept (requiring that customer satisfaction rather than profit maximization be the goal of an organization), that entails learning about customer needs, the influence of technology, competition, and other environmental forces, and acting on that knowledge in order to



become competitive. It is suggested that the market orientation of an organization involves three behavioral components (customer orientation, competitor orientation and inter-functional coordination), and two decision criteria – long term focus and profitability.

### ***Market research***

The systematically executed activity of discovering what people in product and services markets want, need, believe, or even how they act is called market research.

### ***Open innovation***

Open innovation is a new paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firm look to advance their technology.

### ***Open mode of co-creation***

In totally open collaboration, which reaches its extreme with crowdsourcing, everyone (suppliers, customers, designers, research institutions, inventors, students, hobbyists, and even competitors) can participate. This mode of co-creation can best be followed in the conception stage (ideation, problem solving) and re-innovation stage (improvement suggestions, complaints, new ideas, problem solving) where many ideas are welcome. Because of the many participants the best channel for interaction is the online channel.

### ***Radical innovation***

Radical or discontinuous innovations are radical advances like digital photography that profoundly alter the basis for competition in an industry, often rendering old products or ways of working obsolete.

### ***User***

User is the person or organization that uses the product or service for their own benefit.

### ***User innovation***

We refer to user innovation as innovations developed by customers and end users for their own benefit, rather than manufacturers.

### **Premises for customer co-creation**

In this protocol we start from a point where the company has decided or is considering initiating an innovation project or program in which customer involvement might be appropriate. In our theoretical and practical review we have distinguished several premises for this involvement:

1. There are themes or topics in terms of areas of activities and needs that can lead to product and service categories for which the innovation has to be reached;
2. The firm has expectations for the novelty of innovation: either truly novel – a radical or breakthrough innovation – or just an innovation, which can be either incremental or radical.
3. We also assume that the firm has some idea about the target market or customers for this innovation. By this we mean that a primary target group has been identified, e.g. senior or junior consumers, financial services companies, governmental agencies, and such.

4. In addition, the firm also has to have an idea about the time frame in which this innovation program has to be executed.
5. The firm also has to have an idea about the timing of involvement. Customer co-creation can be appropriate in a later phase of the project, although we like to emphasize our finding that the sooner the involvement takes place, the better this is for the project result in terms of speed, market acceptance and product quality<sup>32</sup>. Nevertheless, the firm can decide on involving customers in only a later stage of the project<sup>33</sup>. In such cases, the starting point will be the project results, outcomes and continuation plans at that stage. For instance, the firm may have developed a prototype at that stage, and may want to test its fitness for (potential) users. In such a case, we start in the protocol application with a prototype, its intended functionalities, its design or technological limitations, a description of the target customers, a timetable indicating the intended test period and probable launch, and other relevant variables.
6. We also assume that the preconditions for customer co-creation are or can be met, i.e. the company is or is becoming market-oriented<sup>34</sup>.
7. The market in consideration is suited for firms to involve their customers; that is the market is mature, experience-oriented – instead of product-oriented, the state of technology (Internet) enables interactivity between customers and companies, and customers generally trust the company.
8. Consequently, the company also has to envision the higher outcomes, the so called benefits, of the customer co-creation. As proposed with Design Proposition # 1, a set of benefits can be expected, such as fast adoption, innovation quality, increase of customer loyalty, cost reductions and speed of the innovation. But, not all benefits have to be relevant from the company's perspective, resulting in possible alternative routes.

These assumptions do not imply that it is necessary to have a well defined plan or program description for the intended innovation. However, goals and objectives are necessary to decide on the suitability of customer co-creation and the route to be followed.

#### **Four main routes in one generic approach**

There are certainly many more ways of engaging customers in innovation than presented in this 3CI Protocol. User or customer co-creation is not a panacea for innovation, and there is no 'one-size-fits-all' method. A highly innovative company will use multiple methods. The important first step is to recognize that customers are, in fact, innovative and creative, and using them in the idea generation process as well as in the validation of existing plans and in the commercialization stage can be beneficial to your company. As we will the company needs to decide on certain actions in which it has a freedom of choice, i.e. the sourcing of ideas for the innovation, the type and openness of the innovation, the type and amount of participating customers, the timing of the involvement, and the channel of involvement. Principally, the decisions can be made separately. A decision on one item can, however, constrain the freedom to decide on other items, e.g. sourcing the innovation through user communities seems to determine

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<sup>32</sup> This is depicted in our design proposition 21

<sup>33</sup> See design proposition 22

<sup>34</sup> Design proposition 2

that the innovation has to be open and preferably conducted through the online channel, and starting in or limited to the re-innovation stage. With this in mind, we can identify four main approaches, *routes*, in involving the customer in the innovation process:

1. Through the appeal on a user community – existing or yet to be created, preferably online, but with a physical possibility – where existing products, services or platforms are used, reviewed and discussed by customers. The company observes and participates in this discussion through a dialogue, possibly also moderating the community. Opportunities are identified by the company – we will use the metaphor of *dreamcatcher*<sup>35</sup> – and translated into innovation projects by the company, in which customers again can participate, see the next approaches.
2. The company can pose users with a specific question or request, a challenge, for which they are expected to think of a solution, of which typically one, or a limited amount of solutions are eligible – in metaphor this can be called a *contest*. The intention is to specifically involve the customer in the front end of the innovation, because the company does not know or is not aware yet of customer needs and wants, or the intended product or service requirements. Customer input is then required in the first stage (Conception), but is not necessary excluded in later stages, where customers can test prototypes, assist in the commercialization and the re-innovation.
3. The company can decide to involve customers in any, arbitrary stage or activity of the innovation process, a sort of a one off. In such a case, the company usually has already identified the opportunities, the innovation project and its goals. Customer co-creation is opportune to verify assumptions, fill in details, and provide additional, not thought of product or service requirements. Of course it is possible to involve customer in more than one activity, but this approach is seen as discrete involvement activities to support just that particular and specific stage, in which the involvement is required, usually in the implementation stage and thereafter. The metaphor that can be used for this approach is the customer as a *touchstone*. This approach has been applied in the Client Co-Creation Lab case.
4. The company can, finally, integrate one or more (limited amount of) customers in the innovation project, e.g. by temporarily employing them. We will therefore use the metaphor of customer as an *employee*. This approach is of particular interest in idea generation, design and development activities, i.e. the Conception and Implementation stage, but later stages aren't excluded. We can see this approach

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<sup>35</sup> In Ojibwa (Chippewa) culture, a dreamcatcher (or dream catcher; Ojibwe asabikeshiinh, the inanimate form of the word for "spider" or bawaajige nagwaagan meaning "dream snare") is a handmade object based on a willow hoop, on which is woven a loose net or web. The dreamcatcher is then decorated with personal and sacred items such as feathers and beads. It was said that the dreamcatcher "caught any harm that might be in the air as a spider's web catches and holds whatever comes in contact with it." Traditionally, the Ojibwa construct dreamcatchers by tying sinew strands in a web around a small round or tear-shaped frame of willow (in a way roughly similar to their method for making snowshoe webbing). The resulting "dream-catcher", hung above the bed, is used as a charm to protect sleeping children from nightmares. As dreamcatchers are made of willow and sinew, they are not meant to last forever but are intended to dry out and collapse as the child enters the age of wonderment. The Ojibwa believe that a dreamcatcher changes a person's dreams. Only good dreams would be allowed to filter through, bad dreams would stay in the net, disappearing with the light of day." Good dreams would pass through and slide down the feathers to the sleeper (text based on Wikipedia). The term "dreamcatcher" also refers to the story by Stephen King called Dreamcatcher (2001), in which telepathy shows to be a way of communication when infected with an 'alien virus'. The story was filmed in 2003 by Lawrence Kasdan.

applied in customized projects, where it is the intention to create something for a specific set of customers or segment. This can be on request by the customer or because the company has discovered an unfulfilled or unattended set of needs with these customers, e.g. through dreamcatching.

All four approaches show some similarities: customer co-creation in the innovation process can start any stage in the NPD process, in case we assume a generic staging of Conception, Implementation, Marketing and Re-innovation (see Definitions). Another similarity is that the involvement can be restricted to just one activity, a few activities, but can also entail all innovation activities<sup>36</sup>. Thirdly, as already indicated above, combinations of approaches are possible. But there are also differences.

### Points of consideration

If the premises are met, the firm needs to decide whether it is appropriate to involve customers in this particular project or program, and the route to follow. It entails evaluation of and deciding on items like project objectives (what is the innovation about), the timeliness of involving customers (what do we want to achieve by that), the process stages (when to involve the customers), the channels (physically, virtual, both), the participants (who to involve), and control of the process (who decides in the several stage gates). A first important ingredient of quality in the NPD process is the emphasis on up-front homework in the process, both market and technical assessments, before projects move into the development phase. In essence we propose to follow the so called POST-process<sup>37</sup> – people: what can you expect from participation; objectives: what do you want to get; strategy: how do you want the relationship to be or change; technology: with which means and techniques do you intend to accomplish these objectives. So we need to think before doing.

As we have seen in our review over the different modes of involvement, any sector can harness their customers' potential to co-create. In the Open Innovation approach it's now conventional wisdom that virtually no company should innovate on its own. Firms nowadays have a myriad of potential partners and ways to collaborate with them, making the choice for the right partners and ways much more difficult. Should firms open up and share their intellectual property with the community? Should they nurture collaborative relationships with a few carefully selected partners? Should they harness the "wisdom of crowds"? There is no best approach to leveraging the power of outsiders. Different modes of collaboration involve different strategic trade-offs. Firms who have already tried have become experienced in choosing the right partners, those who haven't should experiment, but should also take caution. In principle, all innovation projects are suitable for customer co-creation. As the Open Innovation Paradigm depicts, it is recommended to source the innovation partly or completely from outside the organization. However, the firm must make decisions on appropriateness, based on the following related considerations:

- *The impact on customer relations and loyalty.* Having customers contribute in innovations has a positive effect on customer relationship, as is concluded in several studies and proposed in our design proposition 1. Although we assume that firms will always contemplate loyal customers, their innovation activities do not have to be aimed at creating customer loyalty. More important objectives of an innovation can be, for instance, staying ahead of competition in terms of market share, being a first

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<sup>36</sup> Design propositions 22, 23, 24.

<sup>37</sup> Li, C., & Bernoff, J. (2008). Groundswell: Winning in a World Transformed by Social Technologies. Boston MA: Harvard Business Press

mover, initial penetration of new markets, rendering increase of customer loyalty a minor or less important objective. Also, involving customers as an experiment or a one-off activity will not be aimed at increasing loyalty. In the case that loyalty is of minor importance, the route of the customer as the touchstone can be followed. Thus, the company has to consider, whether customer relations and customer loyalty are important objectives of the innovation project. In such a case, customer co-creation is recommended, and preferably in more than one project. Simply stated, at this stage, the company has to decide on being market oriented or innovation oriented. To achieve participation, the firm must expose evidence of long run commitment to its customers, i.e. their willingness to continue the cooperation over time. The routes of dreamcatching or even employment of the customer are routes than can be followed.

- *The preferred 'openness' to the project*<sup>38</sup>. Openness is here simply referred to as the amount and diversity of external participants. When a firm uses a closed mode, it is making two implicit assumptions: that it can identify the knowledge domain from which the best solution to its problem will come, and that it can pick the right collaborators in that field. The more specific the innovation is for a customer (customized), the more homogenous and well known the market is, the more comprehensive and finished the idea for the innovation is (concept, prototype, or test ready product), or the more secrecy (IP protection) is required regarding the innovation, the better suited the closed mode of innovating will for the firm<sup>39</sup>. In the open mode firms may want to source as much ideas or customer input as possible to ensure that the great idea or input is obtained<sup>40</sup>. Disadvantage of this approach, however, is that the cost of searching for, screening, selecting contributors and contributions grow as the network of participants becomes larger and can become prohibitive. An open approach can also expose the project too much to competitors, increasing project risk and time pressure. Choosing an open or closed approach will have some consequences for other choices to be made, concerning customer co-creation, i.e. that the routes of dream catching and contest seem to be the best alternatives for the open mode, while the employment and the touchstone can be best taken – in that order – in the case of a closed mode approach.
- *The stage of the innovation process*. The further the firm is in its innovation process, the less necessary or even appropriate it is to involve customers *for the first time* in the project, because customer co-creation could lead to a declination of the reached results, e.g. one research found that customer co-creation in product testing had a negative effect on success<sup>41</sup>. If applied, the touchstone route is preferred over the other routes. Conversely, the earlier we are in the project, the more suitable customer co-creation will be, because this will prevent the firm from developing the wrong specifications, requirements, prototypes and so on. Thus, to increase the success probability of the innovation, the company should aim to involve these customers in an early stage of the innovation process, preferably at the start of the project, making the employment or contest route the best alternatives for involvement. However, we've seen that starting from the Re-innovation stage can leverage the innovation opportunities. This makes the dreamcatcher route the best route available.

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<sup>38</sup> Pisano, G. P., & Verganti, R. (2008). Which Kind of Collaboration Is Right for You? Harvard Business Review, 86(12), 78-86.

<sup>39</sup> Design proposition 9.

<sup>40</sup> Design proposition 10.

<sup>41</sup> Huizenga, E. (2001). Innovation Management: How Frontrunners Stay Ahead. Maastricht: Universitaire Pers Maastricht

- *The preferred 'completeness' of the contribution.* Completeness refers to terms of 'raw ideas', 'market-ready ideas', or 'market-ready products'<sup>42</sup>. The possibilities for the external sourcing of innovations are organized by four variables: (1) the reach that firms have as they cast about for innovative ideas to assess; (2) the cost of acquiring and developing these ideas; (3) the risk involved in trying to turn the ideas in marketable products, and; (4) the speed with which the ideas can be brought to market. The more market-ready the idea or product is the firm is looking for, the higher the costs, but shorter the time to market will be. However, the chance (reach) of finding such market-ready offerings is low. In contrast, raw ideas still have to be developed further, increasing project risk and time to market, but reducing costs and difficulty of finding an idea. Another approach distinguishes two types of customer involvement<sup>43</sup>. The first type of customer involvement is aimed at learning more about customers, their stated and latent needs, in order to create an attractive customer value and thus a demand; this type is comparable with finding raw ideas. The routes of dreamcatching and contest seem to be appropriate for this purpose. The second type is intended to use customers as innovators, using new and proactive techniques, and where customers are seen as business developers with companies utilizing their expertise; this type is best suited for market ready ideas or products. Our view on this is that market-ready ideas or products can be expected mainly from professionals, inventors, or lead users, while ordinary, untrained or inexperienced users are expected to supply mostly raw ideas, of which manufacturability has not been tested at all. Firms can then best follow the route of customer as an employee or touchstone.
- *The accessibility of knowledge concerning the intended innovation.* Knowledge needed from the customer can be difficult to access, reducing the chance for success when involving customers. We therefore propose to apply tools like the ZMET<sup>TM</sup><sup>44</sup>, outcome-based research and netnography to access customers' knowledge<sup>45</sup>. These tools can be applied in any of the four proposed main routes for customer co-creation, whereas we observe that:
  - The more professional, technical or industrial the intended use of the innovation is going to be, the more complex knowledge about the use will be. In such a case, we may expect knowledge to also be difficult to access, making customer co-creation less probable, unless customers are knowledgeable – e.g. lead or professional users, thus making the route of employment the best solution. In the case of low tech, consumption products we will assume knowledge to be easier to access, increasing the chance of ordinary users or customers to be involved, therefore making the routes of dreamcatching, contest, and touchstone

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<sup>42</sup> Nambisan, S., & Sawhney, M. (2007). Buyer's Guide to the Innovation Bazaar. Harvard Business Review, 85(6), 109-118.

<sup>43</sup> Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., & Matthing, J. (Eds.). (2006). Involving Customers in New Service Development. London: Imperial College Press

<sup>44</sup> The Zaltman Metaphor Elicitation Technique<sup>TM</sup> requires specialized, trained and licensed researchers. Not all firms will be able to employ and deploy such techniques, making them dependable on external specialists.

<sup>45</sup> See Appendix D of the dissertation. For literature we refer to: Zaltman, G. (2003). How Customers Think. Essential Insights into the Mind of the Market. Boston, Mass.: Harvard Business School Press; Ulwick, A. W. (2005). What Customers Want. Using Outcome-Driven Innovation to Create Breakthrough Products and Services. New York: McGraw-Hill; Kozinets, R. V. (2002). The Field behind the Screen: Using Netnography for Marketing Research in Online Communities. Journal of Marketing Research, 39(1), 61-72

appropriate ones. However, caution should be taken with this rule of thumb, since research is ambiguous on this matter.

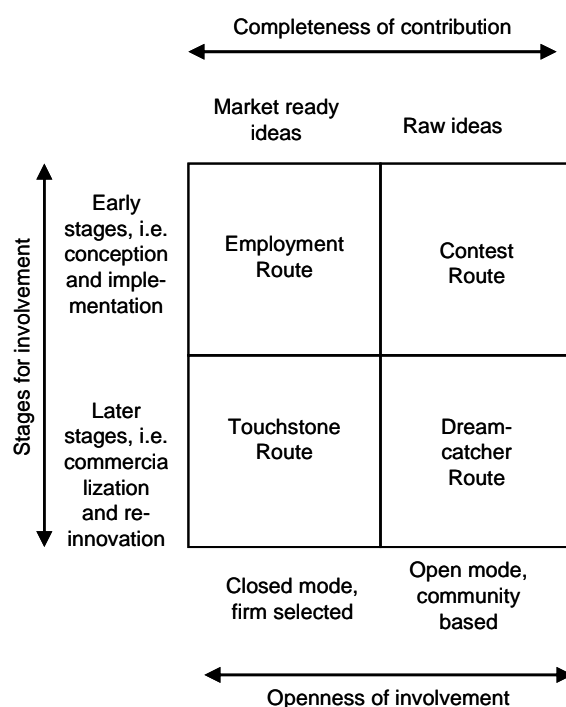
- The more novel, radical and disruptive the intended innovation has to be, the less probable it is that knowledge from customers is easy to access, implying that even lead users or professionals cannot provide necessary solutions. The only opportunities to involve customers will be by judging or testing ideas, concepts or prototypes which the firm develops, i.e. the customer as a touchstone. Customers' contribution in the front end of the innovation will then be limited to customers submitting their inner thoughts and feelings about certain problems, in order to disclose their latent needs and wants, which can be achieved in the dreamcatcher and touchstone routes.
- *The specificity of the problem or question.* The consideration is here whether the firm is looking for solutions to specific questions or trying to discover on its own which solutions or applications exist in the market which it can fit in its innovation<sup>46</sup>. The first option requires a more active participation – it is done by firm's request – , and can be directed towards pre-selected participants, which makes the contest route the best alternative. The discovery option requires the search of a wide and diverse range of possible contributors. Looking for a discovery therefore usually results in higher search costs and more development time than requesting a solution to a specific problem. On the other hand, we expect that asking specific questions requires thorough assessments and screenings of potential innovation directions, in which the customer probably will not take part, unless they are about solving problems or acquiring ideas on existing products and services, or prototypes – the so-called re-innovation phase of NPD. In fact, customer complaints, suggestions, visits, user-to-user interactions in communities, user innovations or modifications may well contain specific solutions that firms are looking for. To summarize this consideration, we need to wonder whether we have specific questions or problems towards our customers for which we want solutions, or that we just want to see what goes on in the market and discover opportunities we can develop into innovations. In the latter case, dreamcatching should be the route to be followed.

Considering these conditions, an important distinction between the four routes can be observed when viewing them as extremes on three dimensions, i.e. the 'openness' of the participation, the stages of involvement, and the 'completeness' of the distribution (see Figure 12-3: Distinction between the four routes on three dimensions). Regarding the dimension 'openness' we refer to our elaboration on the 'open mode and closed mode' of participation, where we distinguish on the one side participants that are mainly selected by the company that involves them – it is a 'closed' appeal to participate (the company engages the customer), while, on the other side, in a certain sense, participants select themselves – there is an open call to participate and one is motivated to comply (customers engage and involve themselves). The employment and touchstone routes are therefore typical closed modes of participation, and the dreamcatcher and contest routes are open modes of participation. The dimension 'completeness of the contribution' refers to the notion where the contribution can be either focused on obtaining or working on an already defined or almost ready concept, product, or service – which we will refer to as 'market ready' – or on a 'raw and unfinished' idea or concept, which has to be 'polished', tailored and finished to a marketable idea or product. In this respect, the employment and touchstone route are best equipped for the 'market ready' ideas and concepts, while the dreamcatcher route and contest route are best deployed for 'raw ideas'. The third

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<sup>46</sup> Hansen, M. T., & Birkinshaw, J. (2007). The Innovation Value Chain. Harvard Business Review, 85(6), 121-130.

dimension, the stages of involvement distinguishes, at the one side, an involvement in the early stages of the innovation process, that is the conception and implementation stage, and at the other side, the two later stages in the process, i.e. the commercialization and re-innovation stage. We will argue later on that the employment and contest routes are best suited for the early stages, while the touchstone and dreamcatcher routes are deployed best in the commercialization and re-innovation stage.



**Figure 12-3: Distinction between the four routes on three dimensions**

Summarized, the options are as follows:

Consideration points for 3CI-decision	Options	Recommended route(s) (in order of suitability)	Remarks
Stage of involvement	Early (in FFE)	Contest Employment	Crowdsourcing (large group) Restrict to only one or a few customers (B2B)
	Late (in Implementation, Commercialization)	Touchstone	Concept, prototype, beta testing Marketing tests Product trial
Expected benefits (on loyalty and CRM)	Improve customer relations	Dreamcatcher Employment	Use customer community When innovation is customer specific
	Other company-driven outcomes	Touchstone	
Preferred openness of 3CI	(Totally) open mode	Contest Dreamcatcher	Crowdsourcing (B2C)
	Closed mode	Employment Touchstone	Customer specific project Market-ready ideas and concepts
Completeness of contribution	Raw ideas	Dreamcatcher Contest	
	Market-ready ideas and concepts	Employment Touchstone	
Knowledge accessibility	Difficult	Employment Touchstone	(High) technology based Radical innovations
	Easy	Dreamcatcher	Low or no technology



Consideration points for 3CI-decision	Options	Recommended route(s) (in order of suitability)	Remarks
			Incremental innovations
Problem specificity	Company specific	Contest	Specify problem and challenge customers
	Market specific	Dreamcatcher	Monitor complaints and user solutions in communities

**Table 12-2: Choosing the best route for involvement**

The aforementioned considerations are very interrelated, implying that we cannot decide in a linear manner on when to and when not to choose for customer co-creation. Decisions made at this stage depend highly on aspects like preferred speed (e.g. for firms in highly competitive industries speed can be a crucial), customer base (large or small, heterogeneous or homogeneous), reach (i.e. how many or which of these customers are we able to reach), available budget, and such. In that respect it is important to realize that customer co-creation also costs money and has to be optimized to ensure the positive final balance of the costs and added value. We also observe that the considerations aren't a matter of either one option or the other, but that mixed options are also possible, as LEGO proves by observing and involving communities, commercializing user innovations and engaging lead users in projects<sup>47</sup>. We also do not exclude the possibility for firms to create a mix of external sources in which many other firms, like suppliers, or research institutes participate<sup>48</sup>, confusing simple decision making on the matter. It is important also to denote that many decisions to be made in this step are also highly dependent on organizational characteristics and the experience that the company itself already has with involving customers or other external parties in innovations or any other organizational process. Otherwise, the organization will expose some barriers that can be detrimental to customer co-creation. Firms should find their own approach in deciding, but we would like to propose to review all these considerations in a facilitated workshop for all concerned in this decision making. The combination of criteria – the innovation project phase, the impact on customer relations and loyalty, the intended openness, the preferred completeness of ideas, the accessibility of knowledge, and the specificity of the problem –, should lead to a discussion, followed by some kind of consensus on whether or not to involve customers, the route to involve them, and expected contributions, by the participants.

### ***Specific aspects***

In industrial and B2B settings, the decision to involve the customer may be made much quicker and easier than in consumer settings, because many B2B companies are already accustomed to this phenomenon, especially those companies that apply an engineer-to-order business model, in which customer co-creation is something like a prerequisite. In addition, B2B-companies usually have more knowledge about the identity and whereabouts of their (lead) customers than B2C-firms have. We therefore expect the route of customer as an employee to be followed more by B2B than by B2C companies, while the contest route (crowdsourcing) typically can be found more in B2C over B2B firms. However, we emphasize that this protocol entails more specifics than what is commonly known and used in B2B on customer involvement. For instance, customers in B2B-sense do not necessarily have to be the same as end users, meaning that, e.g. participation of procurement representatives in project progress meetings, is not what

<sup>47</sup> Seybold, P. B. (2006). *Outside Innovation: How Your Customers Will Co-Design Your Company's Future*. New York: Collins

<sup>48</sup> Tapscott, D., & Williams, A. D. (2007). *Wikinomics: How Mass Collaboration Change Everything*. New York: Wiley & Sons

this protocol intends to achieve. Therefore, even B2B-firms have to review the aforementioned considerations in the context of *end user involvement*.

Companies which have already done innovation projects with customer co-creation incline to skip this step. However, it is advised that such companies should evaluate this strategy on the basis of these outlines, especially when these previous projects concerned the involvement of other users than the end user (see above).

In Figure 12-4: The four alternative routes with applicable design propositions we visualize the 4 probable routes in relation to the design propositions (1-28), the elaboration and the decisions that have to be made to decide on the appropriate route. From this figure we can see that some propositions apply several of the, or even all, four routes, while some apply to only one route. This may look counterintuitive, but we want to emphasize at this point that the figure depicts the *most optimal* flow of decisions and actions, thereby not excluding alternatives.

### **Executing the decision making for the route**

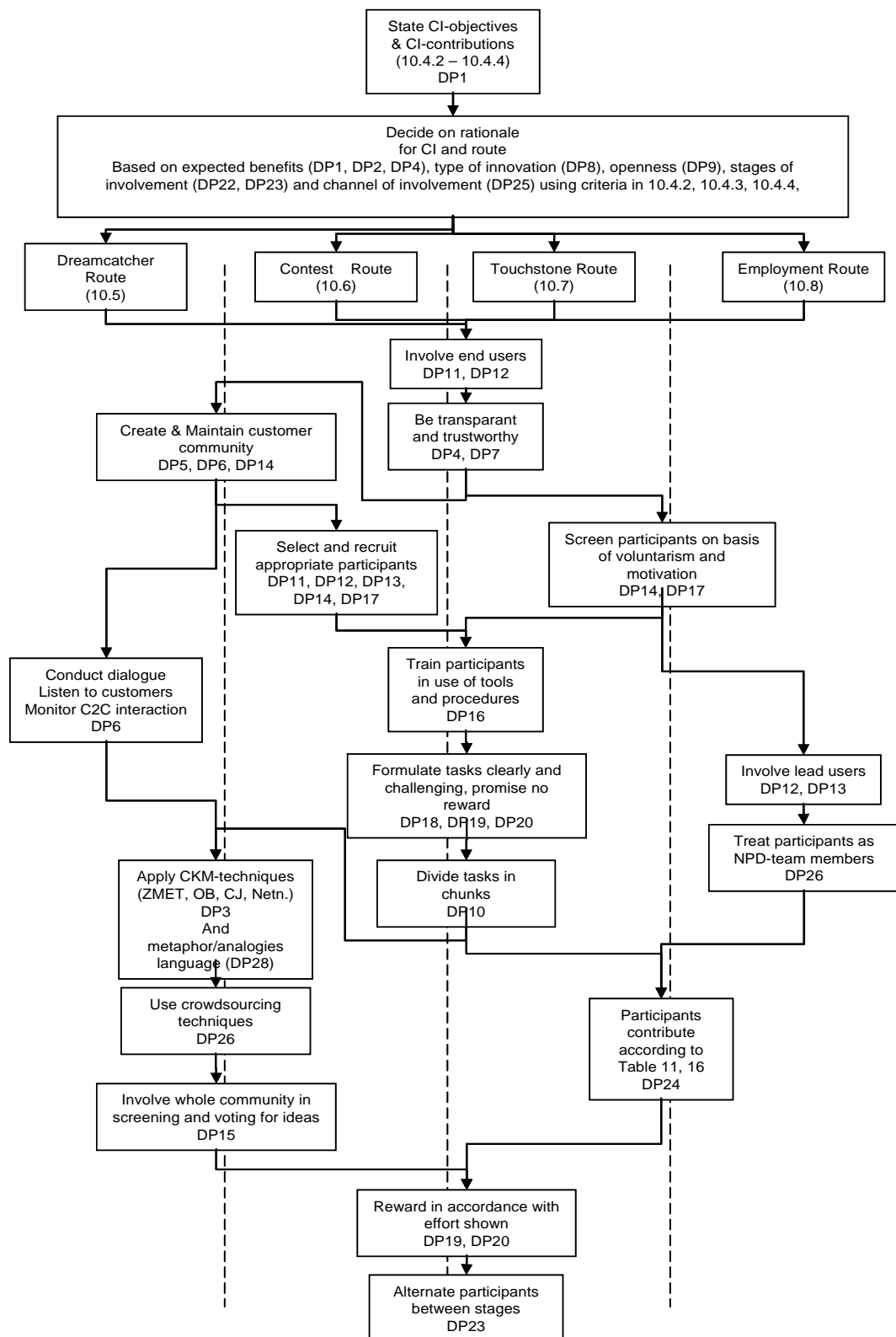
The preferred way to make this decision on whether or not to involve customers and the route to follow is a 3 – 3,5 hrs workshop, preferably prepared and facilitated by an experienced facilitator, presenting and discussing options, best practices and guiding decision taking on the several choices. To prepare for this workshop the facilitator will execute an intake interview with the manager(s), responsible for innovation projects. This intake, a quick scan and the workshop are attached as appendices to this protocol<sup>49</sup>. Its objective is to summarize the context (market, products, customer segments, etc.) and intention (innovation goals) of this specific firm.

The participants for this workshop should be project team members, innovation experts, and product developers of the company, which will be involved in this particular innovation project. As has been elaborated on in our theoretical and practical evaluation of customer co-creation, it implies that these people will be exposed to the customer interaction. In order to manage time and agenda it is advisable to have at least four (4) and at most seven (7) participants.

Preceding the workshop about the suitability check it is advisable to have the participants do a simple test, a so called *Quick Scan*, to support the decision on whether it is appropriate to engage with customers for an innovation. This Quick Scan is also attached as an appendix to the protocol.

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<sup>49</sup> In this version, where the 3CI-protocol itself is attached as an appendix to the dissertation, the mentioned intake and workshop program are attached as appendices to the thesis, see Appendices H, I and J.



**Figure 12-4: The four alternative routes with applicable design propositions**

A recommended (depending on participants' prior knowledge) program for this workshop would be (see also appendix):

1. Introduction and goals of the workshop
2. Benefits and disadvantages of customer co-creation in innovations
3. Based on general theory and practice on involvement, deciding on:
  - a. Participants' requirements
  - b. Phases / periods for involvement and the expected outcomes
  - c. Channels suited for this involvement
  - d. Incentives to motivate and reward participation
  - e. Special tools and techniques:
    - i. Which tools does the firm usually apply and are they suitable to involve customers
    - ii. Which particular exceptions should be made for this usually applied set of tools
4. Deciding on the route for customer co-creation: points of consideration
5. Which persons or functions of the firm are going to participate, i.e. are exposed to the participating customers, conduct communication with customers, etc.
6. Closure of the workshop by setting out the actions customer co-creation (making the plan).

Most SME's do not have large innovation project teams with which we can reach the ideal amount of participants in the workshop. In most cases there will be only one manager responsible for innovations, many times the entrepreneur himself. In such cases it is better to replace the workshop with a strategic sourcing interview, where the workshop program, intake form and quick scan are used as a basis.

## **General guidelines for all routes**

### ***Strategic objectives and rationales of customer co-creation***

Before initiating a customer co-creation project, it is important to state the strategic objectives of the endeavor. Based on the objectives of the new product and service development project or program and available resources, decisions should be made in terms of what the customer should contribute. The stated objectives in terms of customer contributions will influence the rest of the project in terms of the customers who are selected for the task, how much and when they are involved, and by what means. The rationales for involvement are depicted in Design Proposition 1, entailing process effectiveness (like quality of the innovation, fast adoption and increase of customer loyalty), and process efficiency (decrease of innovation costs and NPD speed). But, also be aware that customer co-creation is not a panacea for all your innovations. De-motivated or not engaged customers may stall your innovation process, customers can claim ownership or a share in revenues when they are involved, customers may disclose your secrets to competitors, and, ultimately, sue you for not doing what they have suggested. If you are uncomfortable with these risks or allergic to them, reconsider your plans to involve customers. In the following guidelines we suggest actions you can take to avoid these risks, but it can't be guaranteed that they will not emerge.

### ***Problem definition and formulation***

The most important activity in this step consists of formulating the proper tasks, challenges or questions towards customers. These should be easy to understand, but do not have to be uncomplicated. When the task is too difficult to understand, customers might not be motivated to participate or lose interest during participation. However, if the task is not too simple and the product or service to be developed is also complex, customers might consider it a challenge and be more motivated to participate. Parkinson

for instance, has observed that the extent of user involvement during NPD was far greater for customized products than for standardized products<sup>50</sup>. Problem recognition and understanding is a critical first step in all problem-solving procedures. A problem not understood cannot be solved. The problem should be stated as precisely and concisely as possible, consistent with its real-world complexity as we have stated in Design Proposition 18. The problem statement should be constructed in terms of the capabilities or outcomes sought, not in terms of desired technology, the so-called outcome-based approach. It is difficult but necessary to think of a "land-based people mover," not a "car" or "bus," or of a "container for the foot," not a "shoe."

IBM did in 2006 an Innovation Jam, analogous to their Employee Jam of 2003: a massively parallel conference online. The innovation Jam took place in 2 3-day phases. It uncovered and solved problems in and mobilized support for substantial new ways of using IBM technology. It involved 150,000 IBM employees, family members, business partners, clients (from 67 companies) and university researchers. Participants jammed from 104 countries, and conversations continued 24 hrs a day. The first phase was in July, when the company posted information on key technologies and participants brainstormed new ways to use them. The second was in September, in which participants refined ideas from the first phase. In phase 2 participants were able to click to a separate site where they could work on business plans for key issues using wikis. Many participants logged on just to look around. But participants posted more than 46,000 ideas. People could raise their idea freely, and the management of the Jam was based on the concept that "every idea counts".

The phase 2 participants were asked to indicate which ideas they thought were best and to propose and discuss refinements. Yet even with wikis provided for work on rough-draft business plans, it was rare to find suggestions that built on previously posted ideas. On the other hand, executives found that none of the major ideas from the Jam were completely original. People who had really important ideas had already spoken of them to some IBM managers. Ideas didn't bubble up and get refined through continual, respectful dialogue. In fact, few contributors built constructively on each other's posting.

In an evaluation of the Jam it was observed that the problem definition had been too broad. In the 2008 Jam this was stated more specific.

If the problem is large or complex, it may be advantageous to break it down into sub-problems that can be attacked and handled separately. To make it possible for many contributors to participate effectively in a co-creation community, problems should be broken down to let contributors work in parallel on different pieces. Otherwise, it will be impossible for a critical mass of participants to co-create effectively. The results may then be combined to secure the overall solution.

A global team of more than 2,000 scientists, for example, participated in the design of the ATLAS particle detector, a complex scientific instrument that will be used to detect and measure subatomic particles in high-energy physics. The effort was disaggregated into many different components and distributed across 165 working groups, which used Internet-based tools to help coordinate the work. But it is well to remember that this procedure can result in sub-optimization.

Procedural devices are sometimes helpful in achieving good problem statements. Be concise, but do not arbitrarily limit the length of the statement. It is often useful to

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<sup>50</sup> Parkinson, S. T. (1985). Factors influencing buyer-seller relationships in the market for high-technology products. *Journal of Business Research*, 13(1), 49-60.

require the problem to be restated some minimum number of times, say, four or five. In addition to obtaining a suitable statement of the problem, these reworking techniques also help to familiarize the problem solvers with the various aspects of the problem and its environment. They may even aid in establishing the validity and significance of the problem.

### ***Aim for end user involvement***

This protocol has been developed to involve the (potential) end users of your product or service. End-users often think in terms of making their existing work better, rather than in terms of finding completely new ways of working. For this reason, end-users should be involved. Therefore, aim for their participation, not from any one else. Not those other customers aren't able to help you to develop a new product or service. In this case, however, we aim to involve end users who know what to do with and expect from the product – involving them enhances the chance of developing something that is really needed. In industrial contexts, a firm's procurer must have different requirements when buying a new product, say for example a printer, than the users of that printer, i.e. employees from the different departments. The procurer will look aside from some fixed technical requirements like weight, printing speed, etc., at costs, standardization, delivering time, service deals, and such; the end user may be more interested in user friendliness, reliability, amount of paper in one load, and such things. But keep in mind, in this printer example the procurer might also be an end user. This could be different for other products and services. For consumer situations, there may also be a difference between the buying, the deciding, the selecting and the end user customer. For example, a family pays for its groceries, but the mother may be deciding and selecting on the brand and type of the breakfast cereals for the five year old kid who is the end user. And again, the father might also want to indulge for the cereal in the morning, transforming him into an end user as well.

One should also be aware of the fact that the same product or service may have a diversity of end users. This is particularly the case with composed or complex systems. For instance, an aircraft may distinguish different end users: the pilot when it comes to the flight characteristics, the cabin crew when it comes to its suitability to service the passengers, the maintenance crew in the case of its maintainability, the loading crew when it comes to its storage space and loading ease, and not to forget the passenger that uses the outcomes of the mentioned users.

Boeing involved over 150,000 people around the world in its World Design Team to develop the Boeing 787 Dreamliner. The Design Team is an internet-based global forum that encourages participation and feedback while the company is developing its new airplane. Activities include message boards, conversations with the Boeing design team, and extensive discussions on what members like and don't like about air travel today, as well as features they'd like to see in their dream airplane. Not only (potential) passengers were attracted to participate. The company involved pilots, cabin crew personnel, air traffic controllers, maintenance crews and baggage loaders as well in the context of their use.

To widen your perspective, involve real customers. The best approach depends on your market. The company should not replace customers with employees or other experts, representing or playing the role of the customer – as is the case in use experience software development, unless they are also customers, see for example Kotro (Kotro, 2007). One may not be able to recruit real customers to act as the participating customers because of their anonymity, distance or other reasons. Still, the company should try to reach its real customers. One way to recruit real customers is to move the NPD-team to the customer's offices rather than asking them to join you at yours.

Those who are involved in hobbyist communities and share the values and practices of these communities often also innovate new products. Users are important actors in innovations. Recently, a lot of attention has been paid to users in relation to product development processes and especially user innovations. An article by Kotro<sup>51</sup> points out that product development team members are often simultaneously users themselves and they can be important translators of "hobbyist knowing" into organizational practices. Hobbyist knowing refers to the practice of making sense of situations through concrete activities and participation in particular social and physical circumstances and practices. The article studies Suunto, the Finnish designer and manufacturer company of sports and precision instruments, and the product development team of wrist computers.

One danger of involving real customers is that they won't necessarily reflect the needs of all your customers. Be careful that they don't steer you towards creating products or services that's only useful for them. Your project should remain based on a compelling vision. Customer desires inform the vision and may even change it, but ultimately the product manager holds final responsibility for product direction. To avoid the strong influence of just one customer, we propose to alternate participants throughout the project. Another option, reportedly used by Amazon, is to deploy changes to a small percentage of visitors and observe how their usage patterns change.

### ***Determining which and how many customers to involve***

We have shown that theory is very ambiguous concerning the type of users or consumers to involve. Initial research indicates that not every customer is capable of contributing in the innovation process. Von Hippel suggests that companies should aim on lead users<sup>52</sup>, meaning that these users are usually professionals in the field of work of the product or service being innovated. Other research, however, indicates that ordinary, less experienced users can generate more original or better ideas than professional users. Later research<sup>53</sup> has even proven that, if trained in advance on process skills, ordinary users can complete innovation tasks better than professional designers. We choose in this protocol to involve ordinary users as much as possible to avoid difficult search processes for lead users and the fact that even ordinary users can, when trained appropriately and as long as they are familiar with the product or product class (by being a user or ex-user), can participate in ideation. Lead users can enhance the innovation process in the front end when you are really looking for radical innovations.

Telia Sonera experimented with assistance from researchers of the Karlstadt University in Sweden some experiments in the front end of SMS service innovations. Lead users have long been acknowledged as important contributors to the market success of innovative products and services. The ability of lead users to be such effective innovators has been ascribed to a combination of adequate technological expertise and superior knowledge of the user domain so-called use experience. Ordinary users do not usually possess the technological knowledge of lead users, and the existing literature provides little guidance

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<sup>51</sup> Kotro, T. (2007). User Orientation through Experience: A Study of Hobbyist Knowing in Product Development. Human Technology, 3(2), 154-166; and Kotro, T. (2005). Hobbyist Knowing in Product Development. Desirable Objects and Passion for Sports in Suunto Corporation. Doctoral thesis, University of art and Design, Helsinki, Finland.

<sup>52</sup> von Hippel, E. (2005). Democratizing Innovation. Cambridge, Massachusetts: MIT Press.

<sup>53</sup> Magnusson, P. R. (2009). Exploring the Contributions of Involving Ordinary Users in Ideation of Technology-Based Services. Journal of Product Innovation Management, 26(5), 578-593.

on how to manage such user involvement or its expected contributions. The purpose of the experiments was to establish whether, in user involvement during the ideation phase of innovation in technology-based services, the contribution made in this respect by "ordinary" users differs from professional developers. An empirical study using a quasi-experimental design in which the independent variable is the users' technological knowledge of the underlying mobile telephone system and the dependent variable is the quality of the created idea-proposals from an innovation perspective was conducted. Various scenarios involving guided users, pioneering users, and professionals are investigated. The results indicated that ordinary users create significantly more original and valuable ideas than professional developers and advanced users. Professional developers and advanced users created more easily realizable ideas, and ordinary users created the most valuable ideas. The study finds that the users' knowledge of the underlying technology has an effect on their propensity to contribute with incremental or radical new ideas. The ideas from guided users tend to be more incremental whereas the pioneering users' ideas are more radical. Contrary to the users in the guided user scenarios, the users in the pioneering user scenarios have a propensity to produce ideas that challenge the prevailing dominant logic of the company; these ideas can be used to assist the company to think in new trajectories. The research concludes that ordinary users should not be expected to contribute ideas that can be directly put into the new product development process; rather, ordinary user involvement should be regarded as a process whereby a company learns about users' needs and is inspired to innovate. The paper concludes that user involvement can actually be a stimulus for review of a company's business strategy.

The different phases of the innovation process require different skills and knowledge from the participants in the several phases, implicating that one can not engage the same customers throughout the complete innovation process, because of these changing skill needs. The traditional model of NPD and later generations illustrate and emphasize the importance of customers in several phases of the innovation process, but neglect to state whether this should be the same customers for all stages. Customers can fulfill different roles in the innovation process making it more difficult to find all these roles in one single person. Similarly, having the same persons involved in more than one project, because they have proven to provide effective input in one activity, usually does not guarantee repeated quality of input. Involving the same customers throughout the complete project therefore incurs some limitations to the success of this involvement. Participating customers can show opportunistic behavior or increase the extent of information asymmetry between the company and the customer. When the customers are well involved from the start they feel ownership of the project. This may result in customers engaging themselves in a continuous development process. In our practice we have experienced that engaging with the same customers throughout all stages poses some objections, like a decreasing motivation as time goes on and the effect that people get carried away with their own ideas, thereby blocking new ideas. It is also unlikely that the same individual will repeatedly provide the most effective solution or idea when participating in more than one similar project. Another risk regarding the involvement of the same customers in all stages and projects, which applies mainly to the B2B sector, is that firms risk being locked in their customers' habitats, resulting in possible governmental interventions, a decrease of innovation projects or a loss of interest in the needs and wants of non-involved customers. In a similar way, creating an enduring alliance with one or more customers could lead to such commitments and dependence between alliance partners that this could lead to innovations that are very well accepted by the alliance partners, but neglected by other buyers. We therefore propose to alternate participants along the process and between projects.

In 2006 Douwe Egberts (DE) called in assistance from Altuition for a customer co-creation project. Although the project was intended to innovate in the innovation



processes – i.e. an organizational or management innovation – the choice was made to proof case it by innovating in the BaReCa market in different countries with customer co-creation. DE wanted to use the innovation funnel approach (i.e. the stage-gate approach), by generating some 5 to 8 viable concepts for the implementation stage of the innovation process. The concepts were required to be of a breakthrough (radical or really novel) category. As can be observed from the Advisory Board decisions and customers' reactions, several concepts can be indeed regarded as really novel, although 'ordinary' customers and consumers were involved.

Customer co-creation was clearly aimed at obtaining customer input in the front end of the innovation stage, the conception stage. The reason for this involvement was to develop concepts which were based on customers' needs and wants. Although the focus on specific themes was created by the project team through customer insights, needs and wants were stated by involving participants through personal and group interviews. Proceeding, the idea generation and screening was also done by involving participants. And later on, customers judged the generated concepts and provided ideas to improve them. Participants thus contributed in 3 roles, i.e. as a resource (needs and wants), conceptualizer (generating ideas) and tester (judging concepts).

Finally, it can also be observed that participants were changed in each step. None of the participants, neither customers nor consumers, was involved in more than one activity. The amount of participants varied with the activity which was performed, from one (in the personal interviews) to five (in the group sessions), with a grand total of 62 (39 consumers and 33 business customers) different participants in three countries were involved.

Our own practice<sup>54</sup> and numerous cases, like LEGO, Fiat, Kraft, IBM, show that requirements regarding knowledge, expertise, technical skills, and such do not matter. As long as participants are a qualitative representation of a company's customer base, i.e. familiar with company, its products, and use of its products or services, involvement may always pay off. And obviously, it is can be expected that people who are expressive and socially communicative will provide better input for the process, but we believe that – because it is difficult to find such people – companies can better start with this representation of their customers, and build up experience in recognizing these qualities among them. People to whom it is clear what is expected from them, who feel they can contribute or have contributed previously, and are enthusiastic about that, will contribute, whether professionals, the creative class, amateurs or pro-ams<sup>55</sup>. And the more a firm can engage in participation, the greater the chance that someone or the crowd as a whole will deliver the solution or great idea you are looking for. There is no maximum number of participants, however, in order to get reliable and valuable input, firms should keep a minimum amount of 15 participants in mind – unless your customer base is smaller or the innovation in question is a customized one.

In case of online involvement with participants residing in online communities, we have developed we propose:

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<sup>54</sup> Brabant-Zeeuwse Werkgeversvereniging. (2004). Klantenleercentrum: Van klantgericht naar klantgedreven innoveren. InterActie, jaargang 2 nr. 7, p. 4 (in Dutch).

<sup>55</sup> See for these kind of 'customers' Florida, R. (2002). *The Rise of the Creative Class. And How It's Transforming Work, Leisure, Community and Everyday Life*. New york: Basic Books; Florida, R. (2002). *The Rise of the Creative Class. And How It's Transforming Work, Leisure, Community and Everyday Life*. New york: Basic Books and Gershung, J. (2002). *A New Measure of Social Position: Social Mobility and Human Capital in Britain* (No. WP 2002-2). Colchester: Institute for Social and Economic Research (ISER), University of Essex.

- To gather information about users, usage, product adoption, and product shortcomings or complaints, firms should make use of (existing) user communities – called *virtual customer communities* by Chan and Lee<sup>56</sup>. These communities consist of all kind of users of a product (category) that interact with each other, discussing positive and negative features and experiences. Their contribution is mainly of interest in the marketing and re-innovation phase, and participants do not necessarily have to be recruited for involvement, even though it would be polite of the firm to at least inform them of their involvement.
- However, for all other stages and activities, like e.g. needs assessment, idea generation, concept and product testing, firms can 'recruit' certain users from these customer communities, and create – when a large group is recruited or invited to participate – a so called *innovation community* – named *user content collaboration innovation community* by Chan and Lee – in which they perform tasks or make contributions on invitation by the firm.
- To test products, concepts and prototypes of complex or technological advanced and novel products, firms should preferably involve *lead users* or advanced users that they employ in so called *beta testing volunteer corps*.
- To participate in design and development activities, firms should invite *motivated* and *capable* users from the customer community, and have them form a *user development community*. To establish these features – motivated and capable – firms should have the invitees undergo an intake interview, as is done with recruitment of new employees. These users may be *lead users* or advanced users, but this is not a requirement. However, one may expect advanced users to perform more complex design or development tasks than ordinary users.

### ***Recruiting participants***

To recruit participants, all media or communication channels can be used, website call, emails, newspapers, radio, television, invitations in social networks depending on the amount of disclosure the company wishes to emphasize. Regardless of this media, the firm should take account of the previous guideline on problem formulation, and make it clear in advance to all prospects what is expected from them: the objectives, required skills, intake procedure, specific training, and such.

The search process for suitable users is in itself a creative process that has to be tailored to the specific demands of the search field in question. Two basic processes can be described here:

1. Screening Approach: With a large number of product users a "search pattern" can be used to test the existence of already determined characteristics. As well as that information on hand within the companies from customer data banks, complaints lists or external audit information can also be used here from customer surveys done over the telephone. This process is suitable when the number of customers in the market is manageable and therefore a more or less complete screening of all users is possible. This approach is in particular suitable to collect ideas from representative and extreme users.

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<sup>56</sup> Chan, T.-Y., & Lee, J.-F. (2004). A Comparative Study of Online User Communities Involvement in Product Innovation and Development. Paper presented at the 13th International Conference on Management of Technology (IAMOT), April 3-7. Washington D.C.

2. **Networking Approach:** In this case, only a few customers are included at the beginning and are questioned as to whether they're aware of other product users that have new needs or are currently actively innovative. These kinds of recommendations usually lead very quickly to particularly interesting users. A great advantage of this method lies in the fact that the team often will refer analogous fields in which similar challenges are to be found as those in the actual search field. Depending on your relationship with your customers in B2B situations, you may be able to ask your customers to 'donate' real end-users to participate.

An example of the networking approach is a medical imaging innovation project with the aim of diagnosing very small tumors. During the search process, not only were leading radiologists involved but also experts from the military consulted as Lead Users. In order to identify small forms (e.g. weapons) on satellite images, pattern recognition software is often utilized in the military, where even with bad resolution excellent results are achievable. This application of a pattern recognition system was completely new for medical imaging because until then in-creasing the resolution was the primary goal of research. The networking approach is particularly suitable for the identification of extreme and analogous users.

### ***Innovation benefits from communities***

In some ways, the output of all communities is co-innovation of one kind or another. Either customers are contributing ideas about products or they are offering opinions about branding, advertising and similar subjects<sup>57</sup>. There are also undoubtedly many advantages of the involvement of online communities over, e.g. traditional focus groups. Whilst there are undoubtedly some benefits of using an experienced facilitator in a focus group, there are sometimes problems such as: the facilitator who knows the answer and is hell bent to get there; the questions that are never asked or sought due to over-scripting; the conclusion that is confected because we have a deadline; the attendee who answers as they believe they should not as they would; and the group pressure that gets in the way of individual 'truths'. Some of these factors are of course still present in an online environment but there are arguably some naturally occurring benefits. Artificial deadlines are not as relevant for an 'always on' community. Ideas that the company or the facilitator hadn't thought of will float to the surface if they are important and popular. Ideas are more likely to be judged on their merit than by the lesser known personality or social standing of the contributors. The larger numbers involved make for broader based sampling. And finally, the speed of execution in an online community – a company will generally have the comprehensive 'position' of a community within 24-48 hrs of asking a question – is very attractive for many purposes. For most companies customers are likely to already talk about them in (online) communities. The company can leverage these conversations to gain new insights into its products and find new sources of revenue.

A customer review board may not be a good option for involving communities. Instead, find other ways to involve customers: focus groups, user experience testing, community previews, beta releases, and so forth.

### ***Online involvement (crowdsourcing)***

In case of an online involvement, the company should consider the creation of a customer community and the development of an online toolkit if it intends to have the customer participate more often than this occasion. In case of the online involvement,

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<sup>57</sup> Beagle Research Group, t. (2006). Drop in, turn on, know more. Customer communities invigorate innovation, drive loyalty, and eliminate noise (White Paper): Beagle Research Group LLC.

special attention must also be given by the firm to community management, i.e. training managers and employees for this task.

To build a community we refer to appropriate literature, such as Kim<sup>58</sup>, which has been translated in Design Propositions 4, 5 and 6. If the community already exists, measures have to be taken in order to make community contributions and interaction possible (toolkit). If it is not the company's intention to involve its customers more frequently, it should consider a broker or mediator to facilitate this interaction<sup>59</sup>, preferably in combination with direct engagement. Companies may also consider appealing on social networks, such as MySpace, Facebook, LinkedIn, but have to keep in mind that that this requires consent and support from the network staff, entails a large exposure and may attract others than intended (the target group). In any case, the company should deploy crowdsourcing preparations, i.e. either crowdcasting or crowdstorming methods. In the online case it is especially important to make the challenge easy and uncomplicated, but nonetheless challenging; the firm should also consider making relevant information, like data and already performed research, available to participants<sup>60</sup>. The broker or mediator can assist on this particular aspect.

A generation ago (late 1970s/early1980s), Apple Computer harnessed the power of its user community to design extensions for the Apple II. It published detailed specifications for the software and hardware interfaces, and had active "developer" programs that provided technical, financial, and marketing support. The result was hundreds of thousands of third-party software products and plug-in cards that addressed a variety of applications. It also resulted in greatly increased Apple II sales, since customers knew that whatever they might want to do with their computer, there probably were third-party products available to help them do it.

To select the participants, community members or staff can be approached with the question which particular members are regarded as suited to make contributions. An alternative could be to write out a contest or even virtual stock markets (VSM)<sup>61</sup> to identify qualified community members or lead users, through the mechanism of self-selection. Drawbacks of the selection of lead users through VSMs, however, is that lead users do not all perform well in buying and selling virtual stocks, and that it may attract customers with a tendency toward gambling.

When the initiative has to be integrated in the company's own website, it can be adapted to the choices that are made. There are several companies that are specialized in wikis, forums or social networking that could be useful when interaction is desirable. However, in many crowdcasting cases, a simple upload possibility is sufficient, which would not require much effort. In the case of crowdstorming, however, website design will pose an important challenge in the preparations. Füller et al.<sup>62</sup> provide several criteria to be

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<sup>58</sup> Kim, A. J. (2000). *Community Building on the Web: Secret Strategies for Successful Online Communities*. London: Peachpit Press.

<sup>59</sup> Sawhney, M., Prandelli, E., & Verona, G. (2003). The power of innomediatio. *MIT Sloan Management Review*, 44(2), 77-82.

<sup>60</sup> Geerts, S. A. M. (2009). *Discovering Crowdsourcing. Theory, Classification and Directions for use*. Master Thesis, Eindhoven University of Technology, Eindhoven.

<sup>61</sup> A virtual stock market (VSM) consists of bringing participants, preferably experts, together via the Internet and allowing them to trade shares of virtual stocks (Spann & Skiera, 2003).

<sup>62</sup> Füller, J., Bartl, M., Ernst, H., & Mühlbacher, H. (2006). Community based innovation: How to integrate members of virtual communities into new product development. *Electronic Commerce Research*, 6(1), 57-73.

considered when designing the interaction tool, but state that there is no single best solution for this design, since it also depends on the context, i.e. the purpose and sort of contribution. In any case, this design can also be outsourced to a special organization. A book on the harnessing of social capital also provides many practical tips on the use of technology tools and applications to reach online communities<sup>63</sup>.

You also have to consider repeated participation; at the start your community may still be curious and eager to participate. But how about its willingness when you start involving it structurally, i.e. for more projects and at a declining interval? How will you keep the community motivated to keep on participating? A first answer to this question is your transparency, honesty, clarity and supportiveness in your community approach. But, in addition, you can prevent appealing on the same community members over and over, and instead, spread the “burden” of participation over all members, by alternating participation in subsequent projects.

On February 16, 2007, Dell invited end users to share their ideas and collaborate with Dell to create or modify new products and services through an online community — Dell IdeaStorm ([www.dellideastorm.com](http://www.dellideastorm.com)). With the launch of this website, Dell created a user innovation community where end users freely reveal innovative ideas with community members and Dell. Through IdeaStorm, end users contribute their business ideas to be reviewed, discussed, and voted upon by the user community. Almost immediately, Dell learned its toughest lesson, when it was suggested to install Linux and other OSS applications on Dell computers. Dell initially neglected and, later on, declined such requests, leading to a riot among the community members. When the community started to mob, Dell succumbed.

But not all community-building efforts should be online. Once the company has begun to identify and collect information about its customers, it may consider creating offline meetings for them. For example, if the company creates an online community for its customers, and discover that 100 of them live in Amsterdam, it could work with these customers to set up an offline meeting in the Amsterdam area. This would also be an ideal opportunity for representatives of the company to spend quality face-to-face time with its customers, which is an efficient way to collect valuable feedback.

### ***Dialogue language***

Participants can have diverse cultural and professional backgrounds that can impede a proper understanding by the company. In understanding the customers, especially when it comes to articulating what they need or want. It seems counterintuitive to suggest that customers can't tell how they think or feel. We assume that the motivations for our behavior – whether buying a car, applying for a mortgage or joining a community – are already available to us, waiting to be articulated. But a great deal of multi-disciplinary research – in psychology, cognition, neuroscience, linguistics, and anthropology – is suggesting otherwise<sup>64</sup>, stating that most of our thought, emotion, and learning occur in the unconscious mind – that is, without our awareness. Because language plays such a

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<sup>63</sup> Hunt, T. (2009). *The Whuffie Factor: Using the Power of Social Networks to Build Your Business*. New York, NY: Crown Business.

<sup>64</sup> Zaltman, G. (2003). *How Customers Think. Essential Insights into the Mind of the Market*. Boston, Mass.: Harvard Business School Press; Gladwell, M. (2005). *Blink. The Power of Thinking Without Thinking*. London: Little, Brown and Company; Ariely, D. (2009). *Predictably Irrational. The Hidden Forces that Shape Our Decisions* (Revised and Expanded ed.). London: HarperCollins Publishers; Dijksterhuis, A. P. (2007). *Het slimme onbewuste. Denken met gevoel*. Amsterdam: Uitgeverij Bert Bakker.

prominent role in our lives, we tend to believe it is synonymous with thinking, but in reality, our thoughts precede words, and not vice versa. That thought often takes the form of images or metaphors. Because metaphors extend the boundaries of literal language, they can reveal hidden meanings, needs and wants, or thoughts that might otherwise be overlooked. Metaphors also appear to have neurological foundation, and often reflect our embodied experience.

We believe therefore that, instead of focusing on linguistic aspects, the firm should mind the metaphors and analogies used in the dialogue with their customers. Without further discussion or arguments we thus propose that companies should use their customary tools and techniques as much as possible, but take into account that interaction with the customer is conducted through the (basic) techniques like metaphor and analogy reasoning, and in-depth customer interviews.

### ***Plan for the unexpected***

When participants feel that their in control and are able to influence the outcomes of the company they may tend to exercise that power and act or behave in an unexpected manner, such as criticizing the company's openness, honesty or initiative. Similarly, content contributions can also take unexpected directions, e.g. customers may question the dominant features or needs identified by the company, and suggest other features and needs they deem more important. Projects are each unique, compared to standard operational activities, so they tend to have even a higher uncertainty. Whatever the situation, key take away of these possibilities is that the company shouldn't plan the innovation project in too much or great details<sup>65</sup> (Heath & Heath, 2007). Anticipate for chaos, and learn how to deal with the situation, and do not be inhibited to have participants take (part of) the control over the process.

Another surprise may come from your first attempt to involve the crowd, e.g. through user communities or social media. Initially, you may encounter quite a lot of negative communication about your brand or company. Don't let this set you back or abandon the idea to involve the crowd. It is not unusual that negative word-of-mouth prevails, because negative experiences (whether one's own or others' experiences) are best remembered over normal, expected experiences. Show through dialogue that you are serious and determined about using this feedback for improvement. The sooner you can show real results from these improvements, the more willing the crowd may become to give its support to your initiatives and requests.

Lays Chips conducted a crowdsourcing challenge at the beginning of 2010. The crowd was invited to suggest a new taste for potato chips ("Maak de Smaak"). The company appointed a jury to judge the submissions and select the best three that will be introduced commercially. The one that becomes the greatest hit will be awarded 25,000 Euro and 1% of the turnover of this taste. Over 700,000 submissions were received in one month time. But over 75% of these were banal and obscene, e.g. 'urine chips', showing that crowdsourcing initiatives may encounter negative responses.

Nevertheless, the jury managed to select the three best tasting submissions, which are now in the process of being judged by the crowd again.

### ***Training of participants***

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<sup>65</sup> Heath, C., & Heath, D. (2007). *Made to Stick. Why Some Ideas Survive and Others Die*. New York, NY: Random House; Pollack-Johnson, B. (1995). Hybrid structures and improving forecasting and scheduling in project management. *Journal of Operations Management*, 12(2), 101-117.

If specific tools are to be applied, participants should get training or an introduction in using the particular tool. As long as the designated tools for innovation are easy to learn by the customers, training or introduction probably won't pose any problem. However, when resorting to more difficult and complex tools, companies must be aware that training should get adequate attention. To assess the training intensity and participants' skills, participating customers should undergo an intake before being tasked for involvement. This intake is an in-depth interview (long interview) to chart out participants' mental models and current knowledge, for instance via the ZMET™-methodology. Based on the common mental map, training (or introduction) in the use of the particular tool is designed and administered. But, the interview results can also be used to create an initial set of metaphors or analogies that define the problem the participants are going to solve.

To avoid a decreasing motivation as time goes on and the effect that people get carried away with their own ideas, thereby blocking new ideas, Design Proposition 23 was developed, entailing that we try to change participants in each stage. This will imply extra effort to accustom and eventually train these new participants each time, but on the other hand it ensures new and different ideas and insights throughout the whole process, and also creates diversity in participants, increasing the chance for success.

As a form of rewarding participants for their contributions, companies can choose to appoint them as mentors or trainers for future, new participants, similar to the process of creating seniors and leaders in online communities. The advantage of this choice to involve participants as trainers is that they perceive this nomination as recognition for their contribution. It also increases acceptance of the training by novice participants, since the trainer is perceived as a peer.

### ***Treat participants as your employees or as equals***

When you work co-creatively you are really interacting in a constructive way with your audience. Rather than merely listening to their opinions, in the classic 'stimulus/response' model that dominates the market research industry, mediated by a third party while you keep your distance behind the anonymity of the viewing facility mirror or the quantitative survey, in co-creation sessions members of your target audience are 'seated beside you', contributing ideas, translating business language into everyday words, helping to evolve concepts into more lifelike entities.

If you can't bring real customers on to the team, make an extra effort to involve them. Meet in person with your real customers for the first week or two of the project so you can discuss the project vision and initial release plan. If you're located near each other, meet again for each iteration demo, retrospective, and planning session. If you're far enough apart that regular visits aren't feasible, stay in touch with instant messaging and phone conferences. Try to meet face-to-face at least once per month to discuss plans. If you are so far apart that monthly meetings aren't feasible, meet at least once per concept or prototype version.

Rather than involving real customers as members of the team, create opportunities to solicit their feedback. Some companies create a customer review board filled with their most important customers. They share their plans, ideas and concepts with these customers and—on a rotating basis—provide prototypes or beta-versions for customers to try.

Finally, apply ethics in acquiring data and respect the data you acquire from participants.

If it is via a company website then legislation would expect the company to provide information so that participants can make an informed choice about how much

information to pass over. However, where an organization is using a social networking platform or user created community, where users are using it for their own purposes, things are slightly more difficult. People put information on the internet for a reason. That reason is often purely social – keeping in touch with friends, arranging nights out, whatever it might be. As soon as an organization collects that information and uses it for their purposes, people start to think 'that's not why it's there!' This links to one of the fundamental principles of data protection which is about limiting the purpose for which information is used. Information has been put in the public domain by an individual who has certain expectations about how it will be used and why people might see it. There are codes of practice in use with market research agencies for any organization about what they should tell people before they collect data about them. It is about privacy notice and fair processing. It should explain who you are, the data you need to do what the user wants you to do for them, and how you are going to use it. If you go beyond people's expectations or mislead them then that is when there is a danger of breaking the law. Furthermore, users won't trust you again.

### ***Rewarding participation***

Customers like to be recognized for their accomplishments. While contests with monetary prizes are certainly one way of providing such recognition, often the most motivating form is praise from peers and recognition by the company. LEGO Group understands this well and provides forums for customers to submit their designs and vote on the designs of others. Research shows that many users that participate in co-creation do this mainly for intrinsic reasons (self efficacy, recognition) than for monetary rewards. One of the interesting perspectives is provided from the viewpoint of OSS (open source software) communities where people are working in a voluntary basis without receiving direct compensation. Although some of the participants are getting their salaries from the companies, the basic idea of OSS has been traditionally based on free work and still often is. But, contrary to experimental findings on the negative impact of extrinsic rewards on intrinsic motivations, it was found that being paid and feeling creative on F/OSS projects does not have a significant negative impact on project effort. In the light of the rewarding models used in successful open innovation intermediaries, like InnoCentive, it seems reasonable to assume that multiple and varying types of motivations are present and members may also have multiple simultaneous goals behind their participation. If this is true, a combination of both monetary and non-monetary rewards would be optimal for members. Examples of rewards or incentives are approval, paychecks, trophies, money, praise, attention, grades, scholarships, prizes, food, awards, honor-roll lists, public recognition and privileges.

OhMyNews is a South Korean online newspaper that works with 26,000 'citizen reporters', who send in stories and pictures which make up 80% of all content. OhMyNews pays up to USD 20 per article, though for many citizen reporters, getting their name in the paper is the real reward.

Particularly in the case of B2B customer co-creation, appreciate and also respect the contribution of participants with confidentiality. Participating customers are not inclined to communicate their ideas, problems and solutions to the requesting company, unless they can trust the company to not disclose this information to the participants' competitors or other stakeholders. Communicate this measure in advance, and if needed, do this in writing. Also make arrangements about IP ownership in advance, in order to prevent later discussions and conflicts about IPR.

### ***Evaluation***

It is recommended to evaluate all activities and outcomes in order to adapt the following activities or next project. This is an activity that continuously takes place, making the



protocol process, as has been stated earlier, iterative. Participating customers should be included in these evaluations, since their perceptions and view on process and outcomes have great influence on future participation, not merely their participation, but others' as well. It will also increase trust and loyalty for the company.

It is also suggested to debrief participants on their experiences and willingness to participate again, especially when it was their first time.

### ***Boundary conditions***

Another important aspect in the preparation for customer co-creation is process of removing or reducing organizational and political barriers and implementing the enablers, like creating capacity, making resources available, train employees, assigning a project manager, a moderator for group sessions, and such. The company should also create a mechanism for co-creation, i.e. to take care of clarity and transparency regarding rules, leadership, and processes, both internal as external to the company. One must also consider logistic measures as the recording of meetings, taking meeting notes, reporting progress and results, and such. Finally, it is important to clearly agree with participants on dates, times and duration for interaction, meetings etc.

### **Process stage aspects for all routes**

All phases or stages are suited for involvement with customers as long as the interaction between firm and customers is intensive. We have depicted this in Design Proposition 22. The sooner the customer is involved and the more stages the customer participates in, the better this is for the innovation success<sup>66</sup>. In other words, the sooner and the longer the customer involvement, the better this is. However, organizations should remember that customer co-creation should take place throughout the innovation process, not just in the early phases during what we call the 'front-end' of innovation. Too often, companies fall into this trap. Once they have gotten input from external sources such as the community during the front-end of innovation, they do everything themselves. Granted, it is a good thing to get a more diverse input early on, but why miss out on the full potential of open innovation when you more or less shut down for external resources later in the process. In Table 12-3 we summarize the distinct stages in the NPD and NSD along with the activities in which customers can be involved.

## **Conception Stage**

### ***Requirements Analysis/Strategic Planning***

This activity is best supported by customers through the activity of needs assessment, where the idea is to seek for needs that are not yet fulfilled. Many tools have been developed for this activity, like user observation, focus group interviews, diary-reporting, customer in-depth interviews, etc. We refer to the literature for the specifics of all these tools<sup>67</sup>, and constrain ourselves to mentioning that all these methods require some preparation in terms of selecting a representative sample of customers. But, since we are monitoring a community, usually online, the typical tool to support this activity would be Netnography.

Customers can also be involved in the deciding on the requirements to consider in the following innovation process activities.

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<sup>66</sup> Design propositions 21, 22.

<sup>67</sup> Holt, K., Geschka, H., & Peterlongo, G. (1984). Need Assessment—A Key to User-Oriented Product Innovation. Chichester: Wiley and Sons; Dahan, E., & Hauser, J. R. (2002). The virtual customer. *Journal of Product Innovation Management*, 19(5), 332-353.

Innovation stage/phase	Activities and customer contribution	Customer requirements	Rationale	Tools, techniques, methods
Conception	Giving opinion on Strategic Planning and Requirements Analysis	Restricted to B2B: close customers, lead users	(Lead) users are familiar with needs and are prone to judge solutions correctly. Secrecy/closure is required.	Delphi panel through scenarios Have customers give feedback on plans and potential markets
	Latent needs articulation and specification; Input (needs) for <i>radical innovations</i>	All customers Additional lead users	People are unable to articulate unknown or latent needs, unless they use analogies, metaphors. Elicitation and interpretation techniques are needed for this.	Special techniques like metaphor- and outcome-based communication (interviews), customer journey and netnography. Service tools: Critical Incident Technique, Ethnographical studies, Shadowing
	Idea generation	All customers	Customers are motivated and creative when personal benefits and challenging contributions are perceived. Customers can find solutions for their own problems, criticize existing products and services, and provide a wish list.	Traditional and modern idea generation techniques. Virtual or on-line focus groups Look for metaphors and analogies. Improve creativity by envisioning personal benefits, stating clear objectives and tasking with challenging tasks. Train participants in techniques For services: Body-storming, Unfocus Group
	Idea screening  For radical innovation	All customers  Lead users	Peer review motivates to deliver quality. Not an in-depth selection, but a selection of a large list of ideas: customers can suggest benefits, liking, purchase intent on basis of ideas	Involve other customers (community members) to screen ideas from participants.  Have community point out its lead users Services: Pluralistic Walkthrough
Concept development	Defining requirements	All customers	Customers are able to evaluate requirements in the context of their use problems.	Use outcome-based approach to define requirements. Alternative tools: Consumer Idealized Design Have customer review requirements. Provide prototype or concept for evaluation. For services: provide description of service proposition.
	Design	All well-motivated customers	Co-designing, where customers modify, change, improve or complete the	Have customer design his own product or service by

Innovation stage/phase	Activities and customer contribution	Customer requirements	Rationale	Tools, techniques, methods
			company's initial design is very common.	providing design tools Train in the use of tools
Concept testing	Concept test Prototype testing	All customers	Customers are capable of identifying successful and unsuccessful concepts, provide likelihood to buy, and give feedback on performance Trying out a prototype in use context provides valuable insights on potential success of new products and services.	Concept testing. For services: testing of service description Prototype or service proposition testing Service testing Beta testing Usability tests
Commercialization	Market plan development	All customers		Use online (brand) communities Customer-branding
	Advertising (tests)	All customers	Brand commitment and advocacy can lead vigilante marketing	Have customers make own commercials on e.g. YouTube Commenting on advertisement concepts
	Innovation diffusion	All customers Lead users for radical innovations	Customers can influence other potential users through word of mouth Customer involved creations are easier adopted than company creations.	Testimonials, recommendations Act as launching customer Sampling Member-gets-member actions
Use	Improvement suggestion Complaints Modding, hacking Supporting other users	All customers	During use customers encounter shortcomings in product or service features. Some develop their own solutions, but many complain, either formally or through word of mouth	Monitoring user communities Allow modding and hacking (to some extent) Provide base products for experiments

**Table 12-3: Protocol – Phases, customer requirements, contributions, tools and techniques for involvement**

Threadless.com is a young Chicago-based fashion company that focuses on t-shirts with colorful custom graphics. All products sold by Threadless.com are created by its user community. The proposed designs are inspected, approved and voted for by users before the production process starts. This way, company can ensure that markets exist even before making any investment decisions to new products.

### **Ideation**

There are two basic approaches to Idea Generation: the ***dreamcatcher route***, which operates as an always-open suggestion box, and ***contest route***, which serves as a time-limited event. Research, backed up by several independent studies, has shown that the always-open suggestion programs tend to disintegrate over time. They are often launched with a lot of hype, but after the initial hundred-or-so ideas, the idea flow soon becomes a trickle of just a couple of ideas per week. Research conducted by Imaginatik in 1998 found that time-based events - or 'campaigns' - yield a much higher volume of ideas, in terms of absolute numbers and quality. In comparison to, e.g. ongoing employee suggestion programs, the yield is four- to ten-fold greater, even though events last typically for just four weeks. This created an apparent paradox: participants had less

time to contribute but they submitted a greater number of high quality ideas. In-depth analysis revealed that the artificial time restrictions generate significant user demand to make contributions, and provide an incentive for people not to procrastinate. We also found that business sponsors are more likely to commit to a short event or project, and follow through with the results. The event-based approach is highly suited to short term projects that require input from a broad audience. Typical events include strategic planning, early stage product development, 'emergency' cost reductions, and crisis management. The event-based approach has also proved useful as a means for companies to test the overall approach of Idea Management in their business prior to full-scale investment. In some cases, organizations have attempted to run time-limited campaigns without a specialized tool, and instead make use of existing software such as e-mail, Word documents and the occasional Excel spreadsheet for evaluations. This method can be sufficient when few people are involved in the process, but the manual process is quickly overwhelmed when faced with a volume of ideas. Just 100 ideas can produce 500 e-mails to reviewers, over 2,000 e-mailed comments, and so on, and so on. Studies have shown that a diversity of ideas and opinions are needed to generate high quality solutions, and that can only be achieved through the involvement of many people in the process. Companies then need to have some form of process support to handle the volume and quickly focus on the desired end result: a small number of high impact ideas that can be readily implemented. The event-based approach can be applied in parallel to the ongoing approach of customer suggestion systems.

IBM did in 2006 an Innovation Jam, analogous to their Employee Jam of 2003: a massively parallel conference online. The innovation Jam took place in 2 3-day phases. It uncovered and solved problems in and mobilized support for substantial new ways of using IBM technology. It involved 150,000 IBM employees, family members, business partners, clients (from 67 companies) and university researchers. Participants jammed from 104 countries, and conversations continued 24 hrs a day. The first phase was in July, when the company posted information on key technologies and participants brainstormed new ways to use them. The second was in September, in which participants refined ideas from the first phase. In phase 2 participants were able to click to a separate site where they could work on business plans for key issues using wikis. Many participants logged on just to look around. But participants posted more than 46,000 ideas. People could raise their idea freely, and the management of the Jam was based on the concept that "every idea counts".

But the Jam also shared many difficulties common to large brainstorming sessions. Naturally the brainstorming approach produced many ideas that were completely impractical or irrelevant to IBM's businesses. Monitors found that guiding the conversations was even more difficult than in traditional brainstorming sessions. Many of the skills the moderator needs in face-to-face weren't applicable: body language for instance. And when you go to sleep and come back after 8 hrs you have trouble knowing where ideas came from.

These problems were particularly notable in phase 2, devoted to refining ideas from the 1st phase. Group of managers had carefully sifted through the posts from phase 1 and came up with 31 "big ideas". The phase 2 participants were asked to indicate which ideas they thought were best and to propose and discuss refinements. Yet even with wikis provided for work on rough-draft business plans, it was rare to find suggestions that built on previously posted ideas. On the other hand, executives found that none of the major ideas from the Jam were completely original. People who had really important ideas had already spoken of them to some IBM managers. Ideas didn't bubble up and get refined through continual, respectful dialogue. In fact, few contributors built constructively on each other's posting. The Innovation Jam was organized to capture a huge number of ideas from IBM's network, and it was purposely designed not to guide conversation

artificially toward a quick focus on a few thoughts. But without organizers pushing toward an artificial consensus, conversations did not move toward consensus by themselves.

Rather than emerging during online conversations, new visions emerged afterward. Senior executives spent weeks of sifting through all the postings after each phase, to harvest ideas, extract ideas they thought were key, put them together into coherent business concepts and link them with people who could make them work. Analysts and managers near the top were essential, together with sophisticated software for combing through vast amount of verbiage. Leaders found themselves identifying and nurturing a good idea as it was built on by the organization.

If customers participate in the idea generation the followed method entails that participants perform individual assignments before engaging in group idea generation<sup>68</sup>. This means that the challenge of generating and submitting ideas initially is an individual challenge. After this step, if necessary, groups can be formed to enhance and enrich the individual ideas.

### **Development Stage**

Customer co-creation may take the form of periodic review of designs in process (e.g., mockups, prototypes, partial products) or periodic attendance at design meetings to discuss tradeoffs. When there are one or two large customers (an OEM relationship), each customer may be represented directly (follow the Employment Route). When the number of customers is large, several individuals may be chosen to represent the general population (the Touchstone Route). In the case of a highly complex product, a customer may become a formal design partner (Employment). The marketing professional can play an important role in engaging the customers in the design process by identifying and recruiting customer representatives, and by managing the relationships during the process.

A community-building approach was employed in a small mid-western town bounded by the Ohio River. Community members were involved in a riverfront development project through a variety of activities such as students brainstorming their ideas, and surveys that generated over 200 ideas for the riverfront. Idea-sharing sessions were also held with neighborhood focus groups to gauge the views of a cross-section of citizens about the future development of the riverfront. These activities culminated in a community workshop where 130 citizens began the planning process by revisiting the riverfront through a narrated photographic tour, and reviewing a video summary of the focus groups. Twenty-two groups then identified recreation objectives and located activities on a map of the riverfront. Workshop results formed the basis for a subsequent design proposal followed by implementation of the first phase.

In the design and development activities firms should take in mind that these activities are interaction intensive and can take quite some time, i.e. they are not executed in one or two meetings. To have participating customers travel on and off to each meeting poses an important problem on their participation. Employing online participation and collaboration tools is in such a case a suitable consideration. When participants are given specific and autonomous design and development tasks, they should also be enabled to work on these tasks, without having to travel to the firm each time. In such situations online tools also are appropriate. The best way to involve customers in design and development tasks it is therefore the employment of online tools, like collaboration tools

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<sup>68</sup> Girotra, K., Terwiesch, C., & Ulrich, K. T. (2008). Idea Generation and the Quality of the Best Idea (pp. 44): SSRN; INSEAD Business School.

and design tools<sup>69</sup>. If the employment of online tools is not possible, or the firm does not prefer to use these online tools, temporary employment of the participating customers should be considered, as described in the LEGO case. However, firms should refrain from trying to manage and motivate these 'temporary employees' in a similar way as ordinary employees, since these participants are volunteers and contribute in a creative way.

When MINDSTORMS was first launched in 1998, users hacked the software to expose some of the proprietary APIs (application programming interfaces) and enable programmers to extend the software in ways LEGO Group never imagined. The MINDSTORMS community has always been active and has, through the hacking and modifications 'done far more to add value to LEGO's robotics kit than the company itself.' At first the attitude was wait-and-see, but eventually – after almost a year - LEGO Group concluded that these hacks were resulting in creative new robot designs, furthering the original MINDSTORMS mission of encouraging exploration and ingenuity. So, LEGO decided to open up the source code for the community despite strong concerns from the legal department.

When LEGO was ready to develop its next generation MINDSTORMS product, they invited the lead customers, who were involved in the hacking of the first generation, to co-design the next-generation product with them. With the design of MINDSTORMS NXT LEGO hosted a two-day workshop at MIT with a group of end-users whose opinions they valued in January 2005. The workshop produced numerous ideas and considerable feedback on initial design ideas. LEGO Group then developed a list of 20 top end-users, then hand-selected the top 5. This effort resulted in a panel of four lead users who helped design the MINDSTORMS NXT. Dubbed the "MINDSTORMS User Panelists" (MUPs, or "Muppets"), the panel first provided its "wish list" of features and capabilities. As the design progressed, LEGO Group sent out specifications, then prototypes, for the panel's review and feedback, extending the number of participants to initially 11 key users (November 2005), and later by beta-testing to 100 (March 2006).

When two of the panelists attended a MINDSTORMS tournament at LEGO Group's headquarters, the MINDSTORMS team asked them to stay on for an extra day and proceeded to take them into the labs—the "inner sanctum" for research that was normally off limits to non-employees. Their observations in the lab resulted in additional design changes. This example illustrates the extent to which a company can reach out and engage its lead users. LEGO Group's recruiting of hand-picked lead users and involving them in all facets of the design is also a good example of including customers on the design team. These lead users were selected based on their demonstrated ability to produce advanced designs with the first-generation MINDSTORMS product, and, as a group, they had complementary expertise. They were integrated into the design process by providing them with plans, preliminary specifications, and prototypes for review and comment. By being a select few (four), they were made to feel special and important. Giving them VIP treatment (e.g., taking two of the members into the "inner sanctum") provided further reinforcement. Importantly, not only are the fans invited to sit at the table with LEGO designers to help design new products, LEGO employees increasingly venture outside of the company by taking part in user groups and posting on fan-sites, by data mining personal websites and fan community databases, by announcing new products and programs on private initiative websites.

Customers will participate sooner when it is about a product category where there are large and noticeable differences of product attributes among different items or brands -

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<sup>69</sup> See: Dahan, E., & Hauser, J. R. (2002). The virtual customer. *Journal of Product Innovation Management*, 19(5), 332-353. Also: <http://mitsloan.mit.edu/vc/>

whether physical or merely perceived -, and when these differences are perceived to be of significant importance. Inviting customers to develop a new alternative for e.g. salt, will probably attract less people to volunteer for participation, than in the case of developing a new personal computer. Although the same decisions apply to either product category, firms should be aware of the chance that in the first case participants will be harder to recruit than in the second case.

Prototype testing in advance during NSD will be difficult or even impossible because of the nature of services – they are co-produced with customers when demanded. Because of this feature it is recommended to test new service prototypes and concepts in special locations or on special customers, where their feedback is requested.

Users might also have difficulties in providing valid evaluations of concepts and prototypes as no reference product for the radical innovation exists. We therefore propose to focus on meaning and perception that the customer gives to radical innovation prototypes in the context of their outcomes, by concentrating on metaphors, analogies and outcomes<sup>70</sup>.

### **Marketing and commercialization stage**

Aside from advertising tests, giving feedback on marketing plans and concepts, acting as a launching customer and providing with samples (see Table 12-3) you can involve customers to diffuse your innovation through their word of mouth.

Fiskar Corp. is a 350 year Finnish manufacturer of scissors. Its office and hobby division improved the corporate image and reputation by involving female scrapbookers as advocates that recruited other scrapbookers for an exclusive online brand community called 'Fisk-A-Teers'. Within 5 months online discussion increased by 400 percent, and the brand advocates totaled over 1400.

Social Media has changed the world of marketing forever. Customers, prospects and competitors share information every day through Social Media channels that build relationships, strengthen brands and increase business prospects. And countless people—from start-ups and individuals to well-established companies—are creating sizable returns from social media sites like Twitter, LinkedIn and Facebook. What do all of these people have in common? They know how to use social media tools to generate the kind of exposure that converts relationships to prospects and prospects to sales. And you can, too. Companies attempting to use social networks should develop relationships with key customers over a period of time and progressively refine the social network profiles of those individuals. In this way, the most suitable individuals can be targeted with the right information, products and promotions in the most cost-effective way.

To promote the Aveo among students, Chevrolet launched the Chevy Aveo Livin' Large Campus Challenge in 2006. For this contest 7 student couples were selected to live in the Aveo for a week. Participants posted their experiences in blogs, videos on YouTube and mobilized their friends and their friends on Facebook and MySpace, making the Aveo gain popularity with students.

New technologies and methods of communication are emerging, enabling people to tap into the crowd at any time. The crowd is always on, always there, ready for our questions, ready to respond. The crowd is the most powerful knowledge base we know. And it is free to all to access. So, here you are presented with a very efficient and

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<sup>70</sup> Design Proposition 8

effective platform to market and commercialize your new ideas, products or services. But, don't shove your marketing down people's throats. Social networks succeed for a simple reason; the principle that binds them together is based on conversation and interaction. The way to engage with people is to be interesting and interactive. Doing this implies individual interactions. Not massive marketing by posting ads, banners and product placements on websites. Social networking is about participation and interaction. So the quickest way to build a reputation is to crassly promote yourself, but the reputation that results won't be what you wanted. Instead, whenever anyone searches on your name, they will find a torrent of abuse explaining what a bad company and person you are.

What should you do? One thing you could do is to form an advisory board of your key customers. This group can serve as a sounding board while a product moves through the developmental cycle, and they may become early adopters of the product. Also, advisory board members tend to develop a sense of ownership for the product and become vocal "champions," thereby creating powerful third-party endorsements that can compliment early sales efforts. Another way would be to create a brand community and have your fans create their own ads, promotional films, etc. Maintain this community creating brand fests or other events, like Harley Davidson does, to keep the fire alive<sup>71</sup>. Such community members will inadvertently become your biggest advocates. Their opinion matters more to other customers than yours.

As on how to identify the most influential customers or reviewers of your product we refer to the method developed by Li et al.<sup>72</sup>.

### **Re-innovation or use stage**

During this stage it is important to have customers report their complaints or suggestions for improvements regarding the launched product or service. Monitoring user-user interactions, as described above, can also elicit new needs, wants and ideas. Travelling along the contest route can also be appropriate when looking for raw ideas, as described above in Ideation.

However, when customers are encouraged to create, some will push beyond the intended limits. They can make modifications to the product itself or, at other times, extend the design tools; in both cases, they may publicize their work to the user community and may offer their modifications to others. These changes are commonly referred to as "hacks," since they are outside the scope of the company's specifications. It can be uncomfortable for a company to stand by as users "hack" its product, and it is easy to feel that you are losing control, that most "hackers" have evil motives, and that your intellectual property may be under attack. Companies should be selective about intervening, however, since many of these "hacks" are well intentioned and they actually improve or extend the product to everyone's benefit—including the company's. The company's role is to act as the customer champion and hold back lawyers who are overly zealous in defending the company's products—as long as the hacks are beneficial to the user community and don't result in the outright theft of intellectual or real property. See the LEGO MINDSTORMS case mentioned earlier.

We will now discuss the four main routes.

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<sup>71</sup> Schouten, J. W., & McAlexander, J. H. (1995). Subcultures of Consumption: An Ethnography of the New Bikers. *Journal of Consumer Research*, 22(1), 43-61.

<sup>72</sup> Li, N., & Wu, D. D. (2010). Using text mining and sentiment analysis for online forums hotspot detection and forecast. *Decision Support Systems*, 48(2), 354-368.



## Dreamcatcher

### *General description*

As indicated before, the dreamcatcher route is a metaphor for monitoring customers and users in their interactions with other users and with the firms, in order to discover possible innovation opportunities. It is a way of opportunity searching and thinking in solution spaces. The involvement of the customer in such a situation can be classified as “customer as a user”. This mode of customer co-creation can also be referred to as *emergent or serendipitous* innovation: users create a new product, application or modification by making use of company made available platforms, of which the company becomes aware, and improve, scale and commercialize the innovation. When timely, customers could also be requested to react on some general or more specific questions, such as concepts, ideas, and prototypes from other users.

In the computer games industry modding has evolved into a development model in which users act as unpaid “complementors” to manufacturers’ product platforms. Manufacturers can profit from their abilities to organize and facilitate a process of innovation by user communities and capture the value of the innovations produced in such communities. Examples are Counter-Strike, TheForce.net and Desert Combat.

As depicted in our Design Proposition 5, the appropriate interventions are to create and support a customer community, to provide a basic product or service with which users can freely experiment, while exchanging experiences, ideas, improvements, and such, with each other. The users can also interact with the company on issues like complaints, suggestions, service improvement, and such. This approach can be extremely effective in cases of uncertainty regarding possible product improvements or incremental innovations, of which requirements haven’t been defined yet.

At <http://www.ipodlounge.com/>, avid iPod users congregate not only to talk about their favorite device, but also to show the world (and thus Apple) what they would like the next iPod to do and to look like, or adaptations they've already created in their basement or garage.

By applying this approach in a transparent way, not to promise any rewards in advance and involving all users in the screening of ideas and suggestions through crowdsourcing techniques we will get the most of its potential.

### *Preparing for the dreamcatcher route*

Preparations to follow the dreamcatcher route consist of the development of a user community (described above) and its monitoring, in order to discover opportunities. To monitor communities, companies can monitor users’ blogs, start a company blog to start and support a dialogue with users, check out social networks for the use of their company’s name, products or brands, tapping into consumer-generated content and media sites<sup>73</sup> (YouTube, Flickr). Using social media monitoring, we scan the public social internet to derive insight around a particular brand, category, occasion, need state or demographic. We then analyze this content and use the insights uncovered to define a research agenda to take into a crowdsourcing phase.

If participants encounter any problem or raise specific questions during the course of interaction, these need to be processed and dealt with promptly. In addition, most

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<sup>73</sup> For example, LEGO experiences that many users make movies of their creations and publish these on YouTube. These movies serve as an inspiration to other consumers, but also to the company.

participants also appreciate or expect direct feedback on their contributions, so this must also be provided immediately, to start with, by thanking them for the contribution and communicating what will be done with it.

People are expected to share their thoughts and ideas and the company manages the communities to ensure that everyone's views are respected so that each person feels encouraged to contribute. Typically, community activities can include asking for opinions about anything from a company's products and services to marketing messages and ads. But activities can also include more open ended questions designed to elicit the community members' ideas about more general topics that spark discussion and inform the company about what is really important in their worlds. For example, a brokerage client might ask a community of investors what they think the stock market's next move might be, while a consumer products company might ask its members about fashion or culture. Whatever the situation, the company gathers the "Voice of the Customer" from which flow the serendipitous ideas and insights that enable it to sure handedly make decisions about products, features, services, messages, timing, and much more.

The characteristics of innovation, innovators, and innovation sharing by library users of OPAC information search systems in Australia were explored. This market has capable users, but it is nonetheless clearly a follower with respect to worldwide technological advance. Twenty-six percent of users in this local market do modify their OPACs in both major and minor ways, and OPAC manufacturers judge many of these user modifications to be of commercial interest. Many innovating users freely share their innovations with others, and those that do share information about modifications can be distinguished from those who do not.

### ***Recommended actions***

Finally, we will provide some action points for companies to follow the Dreamcatcher Route in an effective and efficient way. The company should identify all the blogs, websites and other communities where bloggers and their readers converse about the company, its products and its competitors. They should monitor the conversation to determine the marketplace 'buzz'. Knowledge of where and why a company is being praised or criticized would allow the marketing managers to respond to these criticisms. Furthermore, they can identify potential problems at an early stage and take corrective actions before the problem becomes a full-blown issue.

### **Collect information about your customers (CKM)**

Some simple steps to get started:

- Tap into the conversation – go to sites like Google, Technorati and Yahoo and sign up for services that notify you by e-mail when your company is mentioned online. In some cases, they work as fast as a few minutes after an item is posted.
- Listen – when you find people talking about you, first hear what they have to say. Spend a few days just getting a sense of their perspective and agenda.
- Enter the conversation – once you have a sense of who it is you're dealing with, enter cautiously into the conversation via comments and responses and engage these influencers. Be careful: defensiveness and combativeness are considered bad behavior. Acknowledge what they have to say and respect it, even if you don't agree.
- Co-opt the enthusiasts – when you figure out who's passionate about your product or company, enlist them as trusted advisers. Offer freebies, T-shirts and access to developers and executives. Invite them to visit the company and see your development operation. Make them feel like they're special to you. They should be.

- Create affinity programs – your customers are your best marketers. Give enthusiasts incentives to find new prospects, being careful not to reward them directly for positive commentary. That's considered a bad form. Instead, encourage them to set up branded areas on their sites where interested prospects can contact you directly.

### **Create a community for your customers or users**

After you have collected information about whom and where your customers are, and what motivates them, create a community for them. A good place to start is by working with your online customers to create an online meeting place. Ideally, you can identify customers who are already participating in online forums and blogs, because these customers are already familiar with online communities. Once you have created an online meeting place for your customers, it will become easier for them to share information and recruit new customers for your brand and products. This is another example of letting customers be evangelists. *Key action point:* Make every effort to create a sense of community among your customers. Your goal should be to make it as easy as possible for your customers to come together and share information, and their love of your brand. Your company should also make every effort to itself be a member of these communities, whether they are online, or offline. Doing so will not only help your company accumulate invaluable feedback from your customers but also make them more likely to evangelize your brand—and increase the chance that you'll convert customers who visit these communities into fellow evangelists. Although most of these actions are addressed at creating an online community, the building of an offline community follows the same principles.

### **Be accessible**

Make sure customers have as many avenues as possible to give feedback, and do everything to encourage that feedback—online and offline. Simply taking the time to listen to customers, showing them that you respect them and value their input, is often enough to create loyal customer that can act as evangelists. Customers appreciate and value brands that appreciate and value them. *Key action point:* Create and maintain as many channels of communication as possible between your and your customers. Add areas on your Web site and blog where customers can leave feedback, including suggestions. Make sure your product packaging includes information on how to contact customer service, and how to leave suggestions and feedback. Never make your customer have to look for this information; make all your company's contact information as easily available as possible.

### **Monitor customer feedback**

Understand that loyal customers may be passionate about your brand but that doesn't mean they won't criticize you as well. Loyal customers feel a sense of ownership in a brand, and if they think that a company is doing something that dilutes the brand they will not hesitate to let the company know their feelings. But remember that such a complaint or criticism is rooted in passion, and where there is passion there's a potential evangelist. *Key action point:* Make it easy for customers to leave you feedback. Add contact forms or email links to your Web site and blog, and include contact information on your product's packaging and any emails you send. And acknowledge receipt of the feedback. Doing so not only helps your company better market itself but also gives you a chance to convert a complainer into a loyal customer. Ignoring feedback could lead to negative perceptions about the company or brand.

A lot of talking and commenting goes on at <http://www.niketalk.com/>, the non-affiliated online sneaker community which so far has received more than 200 million visits and 3.5 million posts. Every Sunday at 9 PM EST, their sister site, chat room NikeChat, welcomes Nike fans from around the world, to exchange views, tips and more.

### **Let your loyal or best customers be evangelists**

Do everything you can to empower your existing customers. This point ties into earlier ones: Make sure that they have easy access to any information about your brand or product, as well as many feedback channels as possible. Consider launching a blogger-outreach program for your customers who are also bloggers. This would make it easier for your evangelists to promote your brand or products in the blogosphere. *Key action point:* View your evangelists as volunteer salespeople for your brand, because that's exactly what they are. Give them all the information and tools they need to promote your brand to other customers. Consider giving free samples to your evangelists, or creating an outreach program around them. Make it as easy as possible for your evangelists to promote your brand to everyone they come in contact with.

In 2005 the LEGO Group announced its "LEGO Ambassador" program for AFOLs worldwide. The purpose of this program is to expand mutually useful relations between the LEGO Group and its loyal, talented and committed consumers. Each LEGO Ambassador Program cycle is one year. LEGO Ambassadors are selected by the LEGO Group based on nominations from LEGO User Groups. The current LEGO Ambassador Program cycle has 40 members from 22 different countries all over the world. All LEGO Ambassadors members are expected to exemplify the program fundamentals of building proficiency, enthusiasm, and professionalism towards the public, other fans, the LEGO community and the LEGO group. In addition, LEGO Ambassadors members agree to be active contributors to the LEGO world-wide community by: contributing regularly to online discussions, participate in local user groups, or help to start one in the local area, and advice new fans just joining the hobby. Being a LEGO Ambassador does not cost money but only a few people are selected each year. Joining the LEGO Certified Professionals program costs US\$1000 a year but more people can apply for this title. Some LEGO fans have turned their passion for building and creating with LEGO bricks into a full-time or part-time profession: LEGO Certified Professionals who have been officially recognized by the LEGO Group as trusted business partners. Today there are 9 LEGO Certified Professionals. The program was extended by 3 persons during 2008. At an early stage of the LEGO Universe project, back in 2006, it was decided - subject to a confidentiality declaration - to include a group of adult LEGO fans in the development project. At present, the LEGO Universe Partners program (LUP) has approx. 50 active participants.

### **Apply netnography**

Apply ethnographic research to on-line communities as a better, faster and more cost effective way of generating insights. Use a combination of observational netnography to uncover insights by studying members of a community and participatory netnography, to take more of an active role in a community. Netnography uses a range of web 2.0 qualitative research tools such as on-line focus groups, diaries, forums, blogs, chat and multimedia functionality. These tools can be brought together within a bespoke research community to help companies interact directly with groups of customers or advocates. Encourage participants to connect and interact with one another. This is important because new insights emerge when you hear customers talking to one another in their natural voices and not simply responding to researchers' questions.

### **Contest route**

#### ***General description***

When looking for a substantially large amount of ideas for a specific (company-defined) problem, the company can (crowd) cast a contest to find a solution to the problem. Through an appeal in the community, consisting of users and customers, the company can rely on discovering one or more solutions to new ideas for a product or service, functional, and sometimes even technical, requirements for products and services, but

also design solutions, and not to overlook, ideas for advertising, marketing and diffusing the new product or service. The company collects ideas, assess them, have a jury (ideally the community itself) select the best, and most promising idea(s) and reward the contestant(s) with an appropriate prize. This Contest Route differs from the Dreamcatcher Route in respect that the problem for which the company is seeking a solution is clearly defined, whereas the Dreamcatcher is aimed at searching for opportunities.

The concept for a third generation 500 started in 2004 with the Fiat Trepuno Concept unveiled at the 2004 Geneva Motor Show. After a failed re-launch in the 1990s FIAT decided to involve the public, consisting of fans, to co-design the car. "For the first time in the history of our company, and perhaps of the motor industry as a whole, a car will be created with the public and for the public," explained Luca De Meo, Brand & Commercial Manager for Fiat. A special website, "500 Wants You", was launched on May 3, 2006 – 500 days before the launch – and invited the public to think along about the exterior and interior of this new car. The "500 wants you" project was – and still is – an online laboratory, where users discover the stylistic concept of the new car, express their preferences, propose ideas and contribute to its creation, in a combined, active way. The website is defined as a creative space and includes several sections: (1) Homepage redesign: here web designers can create a new homepage for the fiat500.com website; (2) 500-ology: the purpose of this section is to create an online encyclopedia of stories and pictures dedicated to the Fiat 500, written jointly with the public; (3) Fiat 500 Concept Lab: here people can configure and add accessories to the new Fiat 500. It is also possible to send suggestions for new design options. Once finished, new projects can be published under the author's name and then viewed and modified by the public; (4) Design Contest: this is the most interesting part. Issued in partnership with Designboom (an independent web magazine for the design world), this contest is open to professionals, students and design amateurs from all over the world. It is divided in three sections: Accessories, Lifestyle and Places, all connected to the Fiat 500 world. The first prize for each theme will be 5,000.00 Euro. Submissions were judged by an international jury made up of personalities from the design, fashion and automotive industries and a selection of the best works were published by Designboom. The contest ended in September 2006.

### ***Preparations for the contest route***

As stated, it is useful to provide a community a forum for contributing new ideas. The web-based idea submission form is one method, although that provides limited feedback even if each submission receives an acknowledgement. A more powerful method is an on-line forum in which customers can see and respond to the submissions of others—it becomes a community where customers can interact. The company can increase the excitement by having contests for the best/most unusual/"I wish I had thought of that" ideas (or any other categories one can think of). While this involves more effort to set up and monitor, it is much more effective at getting the customers engaged. Any prizes the company awards will be inexpensive relative to the information you will get in return.

Participants can be notified or invited to undertake required actions or make specific contributions through emails or banners, if necessary through a trustworthy online community member, e.g. when the participants' names are not known to the firm. If participants encounter any problem or raise specific questions during the course of interaction, these need to be processed and dealt with promptly. In addition, most participants also appreciate or expect direct feedback on their contributions, so this must also be provided immediately, to start with, by thanking them for the contribution and communicating what will be done with it.

Salesforce.com Inc, an online CRM-application developer, launched IdeaExchange in 2006 which enables its customers to propose new functionalities as well to vote for their popularity. Because of IdeaExchange Salesforce.com started to release new applications and managed to stay ahead of its competitors.

In this route the use of idea boxes and competitions for customers serve as tools to extract ideas and innovations from other than designers and engineers tasked for a particular R&D project. Recently tools and methods to further develop the mechanism have been created. One example is an Internet-based Toolkits for Idea Competitions (TIC)<sup>74</sup>, a way for manufacturers to access innovative ideas and solutions from users.

### ***Recommended actions***

#### **Promote the contest**

First of all you have to promote this, either through your existing channels or creating new ones (such as a specific web site). Emailing potential participants is therefore a 'personal' approach that may elicit a larger response. Making use of traditional communication channels, such as newspapers, television, radio and others also comes of handy. But in these times you might also consider a promotion of the contest via social media, like Facebook, MySpace, Hyves, YouTube, etc. Blogging about the contest is also recommended.

Rabobank, a Dutch cooperative bank in the Netherlands, started the Innovation Challenge on Hyves, a social network that is very popular in the Netherlands. Everyone interested could submit a creative idea on a special Hyves-page, from which the most promising ones were selected and could present themselves on Emerge eDay.

#### **Use crowdsourcing techniques**

Harnessing the wisdom of the crowd explores insights further. Crowdsourcing can be used to uncover problems and divine top line solutions to a particular issue. This route can also be a really useful way to try and quantify opinions and issues. Think of crowdsourcing as a way to ask qualitative questions of a quantitative sample.

#### **Provide clear and challenging instructions on what is expected**

Customers would like to contribute when the task is clear and challenging; easy tasks are ignored and unclear requests lead to confusion on what is expected. So, you need to define clearly what you expect from participants, be transparent on how you process the contributions, and decide on their usability.

Gold Corp is a Canadian mining company that was struggling to turn up sufficient finds until it published all of its most sensitive data (maps and geological surveys) on the internet, offering a reward to anyone who could help them more accurately prospect for gold. Helped by the collective power of geologists, prospectors and academics worldwide, Gold Corp massively increased its finds and therefore its share price.

#### **Respect your customers**

Consider the customers you work with as experts in their own right, whether they are technology addicts helping you generate new mobile applications, or housewives working on repositioning a globally renowned air freshener. Whatever their background or

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<sup>74</sup> Piller, F. T., & Walcher, D. (2006). Toolkits for idea competitions: a novel method to integrate users in new product development. R&D Management, 36(3), 307-318.

particular expert perspective on life, approach them as equals and partners in the process. Do not ridicule or ignore ideas, do not procrastinate the process, giving participants the idea that they are not taken seriously.

### **Provide and explain the proper tools for participation**

In online communities, members can have a whole range of social media tools available to them, from multimedia uploading facilities to an instant status update tool, in order to express themselves and demonstrate in their own words, pictures and actions how a particular issue plays out in their lives and minds. But, you might want to standardize the format for inputs, and thus need to develop a specific tool for submission of the participants' contribution. Be aware that participants will not be familiar with the tool, so provide instructions or training for proper application.

### **Monitor and acknowledge responses**

Then you need somebody monitoring and moderating response. Maybe you wish to check they are decent ideas and original and do not breach any patent (of course it depends on how far you want to go in making sure that the content you receive and expose does not cause issues). Checking may range from doing some research, to running some tests (if it is software code), to browsing licenses and IPs.

### **Process all submissions**

If you allow the audience to rate ideas, then you need to make sure that every idea is given a chance, so you may have to edit some of the content to bring them up to the same presentation standard that puts them pretty much on equal footing.

When the submissions are closed you are left with many applications and how they are rated. What do you do with them? You need to go deeper in each of them – possibly starting from those with higher rating – and check whether they make sense in your architecture and really fit your needs. Now pick the best solution, but be aware this is still a half-baked idea, an incomplete design, a prototype application, which needs to be turned into something you and your stakeholders can trust. Launch another round of crowdsourcing to get the version 0.2, but try to engage with other participants than before. You can't expect that the same community will suddenly come with the ultimate answer or volunteer to work at very low or no cost at all, again. And even if it did, how would you get assurance that the result meets all your functional and non-functional requirements? At some point in time, in this seamlessly participative process, the line between the client and the supplier role must be drawn. It is very possible that the end result will be much better than what it would be following a more traditional process.

### **Be prepared for the tsunami**

To make the most of the excitement, interest and motivation of contestants companies need to be prepared to act on the volume of good ideas generated. The success of the first jam caught IBM by surprise and they weren't prepared for the large body of interest. Over time they have developed methodologies to effectively facilitate large groups to capture the ideas and refine them further. So, be prepared and reserve sufficient resources to deal with a large stream of ideas. See the earlier presented case of IBM Innovation Jam.

Never assume that "ready to go" ideas found outside are truly ready to go. There will always be development work to do, including risky scale-up. Don't underestimate the internal resources required. You'll need a fulltime, senior executive to run any customer involved initiative.

### **Reward appropriately**

It is not sufficient to promise rewards for excellent ideas that lead to a killer app. Most people do not believe that they are capable of ever coming with such an idea. This will inhibit them from participation. So, reward the attempts, not the results. Rewarding attempts leads to better results.

Home appliance manufacturer Electrolux has an annual Design Lab contest, which invites design students from around the globe to submit ideas based on a specific theme. Previous themes have included designs to encourage healthy eating habits and designing eco-friendly, sustainable solutions. The winner receives an internship at one of the company's Design Centers. To improve the quality of entrants and make them more focused and relevant, the Design Lab briefings have become increasingly narrow on specific themes, aiming for quality over quantity.

### **Touchstone route**

#### ***General description***

Especially for situations where the company has a very fine idea or solution for the new product or service it may want to test its ideas, concepts, prototypes with customers to find out whether the idea is correct or needs to be enhanced on the basis of customers' insights. This can be done for the output of all innovation activities and stages, such as ideas, functional and technical requirements, designs, concepts, prototypes, product proposals, advertising and marketing ideas or concepts, by exposing these to customers, that respond to the questions "What do you think of this idea or concept?" and "How can this idea or concept be improved (to fit your needs better)?"

Following this route can help break the yo-yo effect of research and development, where companies go back and forward between creative agencies, research agencies and their audience. By working with your customers, rather than directing stuff at them in the hope that it will stick, companies get a real sense of what works and what doesn't as the ideation takes place. Ideas emerge, develop, are refined and validated in collaboration with your audience, in real time. No need to wait around for endless tests.

3M's Telecom Systems Division holds a cafeteria fair at customer sites to see how that site is using 3M products and to expose customers to products they may not be using. 3M finds the insights useful in approaching other sites and customers and in helping customers learn about the range of its products and services. It also helps 3M understand how different sites (regions, countries) of the same business customer vary in their levels of satisfaction with the same product.

#### ***Preparations for the touchstone route***

##### **Virtual Focus Groups**

Focus group interviews, where a group of consumers gather in a room to discuss a product, play an important role in the new product development process. This is also where the first ideas behind many innovations have been generated. With the emergence of blogs, focus group interviews can now be conducted virtually on a website. This allows marketing and innovation teams to recruit participants from all over the world. One is no longer limited to recruiting from one region. Success of focus group interviews depend on the diversity of opinions held by the participants that leads to a lively discussion. This diversity is enhanced when participants are from different regions or countries. Moreover, virtual focus group interviews are cheaper to conduct, as participants do not have to travel from their house to interview site. They can participate from the privacy of their



homes or offices. This privacy also ensures that participants are more honest with their opinion and less susceptible to groupthink.

Owela (<http://owela.vtt.fi>) is a participatory web laboratory for designing digital media products and services. It aims to be a conversational web community that connects members with developers and researchers and promotes open innovation. Owela offers social media tools for gathering member needs and development ideas as well as collecting feedback for scenarios and prototypes.

### **Governmental and community innovation tools to support citizen participation**

Techniques for participation have evolved as a result of the criticism of citizen involvement as being time-consuming, inefficient, and not very productive. Usually municipalities involve citizens by community meetings or public hearings, where typically only the most aggressive personalities tend to participate, thus dominating the discussion, and decisions are made through voting. The key to making community design work effectively is a range of techniques enabling professionals and citizens to creatively collaborate, where voting is replaced by consensus decision making<sup>75</sup>.

A wide range of techniques are available. In general, many of the techniques facilitate citizens' awareness to environmental situations, and help activate their creative thinking. The techniques can be classified into three major categories: awareness methods (newspapers, planned tours and walks through the environment), group-interaction methods (surveys, questionnaires and face-to-face interviews), and indirect methods (workshops, focus groups, gaming, and the charette process). A *charette* is an intensive participatory process lasting several days or longer, depending on the complexity of the problem. It convenes interest groups in a series of interactive meetings aimed at solving particular problems. Phases of the charette process may include workshops or working sessions that engage participants in the development of ideas, recommendations, and decisions.

### ***Recommended actions***

#### **Repeatedly test ideas and concepts**

We would advocate taking NPD outputs like ideas and concepts – even when submitted by customers in earlier stages – back online for further refinement and validation. One invaluable aspect of co-creation outputs is their articulation in consumer language rather than marketing speak, and by taking concepts back online into a community of fresh, critical and unbiased target consumers we have the opportunity to expose concepts to a relevant and constructively critical audience. Community members will pick ideas apart on the level of individual words and phrases, as well as comment on visualization and other aspects of articulation, to help ensure that the ideas are expressed as clearly and relevantly as possible.

In the Cafes, Bars and Restaurants Insight based Concept Development for Douwe Egberts the phase 5 activities (concept testing and strengthening) were initially intended

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<sup>75</sup> Rosener, J. (1978). Matching method to purpose. The challenges of planning citizen participation activities. In Langton, S. (Ed.), *Citizen Participation in America* (pp. 110-111). New York: Lexington Books; Sanoff, H. (2000). *Community Participation Methods in Design and Planning*. New York: Wiley; Creighton, J. L. (1994). *Involving Citizens in Community Decisions Making: A Guidebook*. Washington, DC: Program for Community problem Solving.

for execution with only the business customers. However, the insights have demonstrated that offerings in the segment are important for consumers as well. Therefore focus groups for consumers have been included in the work plan. The respondents in Phase 5 consisted of men and women, age ranging from 25-35 years. Customers were waiters, owners or managers of bars, cafeterias and restaurants. Consumers were people who go at least 5 times per week to drink or eat out of home whereas they all drink and like coffee. In the Netherlands 3 customers were interviewed. The consumer sessions consisted of 2 focus groups, 5 consumers per group. The interviews and group session were scheduled in 2 consecutive days. For Spain and the Czech Republic, 3 – 4 customers were interviewed and 2 focus groups, each 4 – 5 consumers were conducted. Customer interviews and consumer group sessions were executed in 2 consecutive days in order to save on travelling time and costs for the facilitators. Participating customers were requested to sign a non disclosure agreement to prevent leakage about the concepts towards competitors.

The objective of this research was to define the acceptance of those concepts by both customers and consumers. More in depth, for each concept the following aspects were explored: (1) general interest and engagement of respondents with the proposal; (2) fit with customers and clients needs; (3) novelty and differentiation; (4) key elements of the idea; (5) main likes and dislikes; (6) key benefits of the concept for customers and consumers; (7) issues regarding the feasibility and convenience of the concept; (8) reactions towards the price and willingness to buy; (9) projected moments of use and consumer profile; (10) brand image; and (11) optimizations for the concepts. The method used: the whole concept test research was conducted in three rounds, with about one week interval, each round followed with an adaptation of the concept, based on the findings of that round. Dependent on the country and target group in depth interviews lasting 1.5 hours (Spain and Czech, in NL for customers) or focus groups of 3 hours (in NL for consumers) were conducted. The execution of Strengthening & Testing Focus group sessions was video recorded.

## **Employment route**

### ***General description***

Typically, this route usually follows face-to-face meetings and workshops between the NPD-team and customer participants – sessions designed to bring professionals and customers together to problem solve, design and develop. Capitalizing on the insight, understanding and potentially initial solutions that have been derived through social media analysis, crowdsourcing and online community work, the employment route is an opportunity to really build on these learnings and develop worked up solutions. This kind of user involvement is not normally connected to customer as user, but may be found as a challenge in “users as developers” within new product development.

Similar to what Apple did with the Apple II computer, Palm involved many developers and users for the development of applications when it introduced the model 1000 in 1996. What Palm did was to make its development environment and development tools freely available instead of licensing it, and this increased the interest among over 300,000 potential developers to make programs and applications for the Palm OS. Palm offered developers formal training, company-hosted meetings, and even hired staff to answer their questions.

### ***Preparations for the employment route***

Prepare for this route as if you are preparing for the recruitment of new employees. Define what their job and task is going to be, prepare for appropriate training, communication, and reward. Recruitment and screening can be achieved by monitoring customer communities or asking around.

## ***Recommended actions***

### **Select potential participants carefully**

There is saying that only 1% of your customers are capable of being creative and sourceful to collaborate in an active way with you. We have elaborated that, in principle, everybody can be creative and sourceful. However, not everyone is inclined to be stimulated or seduced to help you out, particularly when it looks like working for you. Only motivated, and often experienced customers, will show interest and are capable of taking part in the invitation. It means looking at your potential participants not just as customers that want to buy something from you but as people who want to have a deeper and more meaningful relationship with you. Therefore, select the participants thoroughly by interviewing them on their motivations, their commitment and their needs. It quickly reveals that there are all sorts of customers with different levels of passion, interaction and sizes of network who want to engage with your brand. Their desire to do things with you varies, so they need to be engaged with differently.

### **Look for (additional) lead users**

You are requiring a great sacrifice from participants to commit resources like time, knowledge and creativity to your benefit. So, you will want it to be worth the effort. To increase your chance on good input, you might want to involve an additional amount of lead users in the project. To find them, simply ask around in the customer community. See also our general guidelines.

### **Treat participants as your own employees**

As has been elaborated, we want an active and intense participation from the participating customers, as if they are members of the NPD/NSD-team. Participants should be treated as active equals rather than as passive respondents in the brand marketing process. By giving customers more active and direct responsibility in your research, innovation and planning approach you are able to stay much closer to your customers' ever changing needs. It also means you are able to create better insights, product ideas and social media strategies; dramatically speed up the innovation process and radically reduce the cost of new product development.

Consider the customers you work with as experts in their own right, whether they are technology addicts helping you generate new mobile applications, or housewives working on repositioning a globally renowned air freshener. Whatever their background or particular expert perspective on life, approach them as equals and partners in the process. Participating customers will therefore be treated as firm innovation team members: they will be treated equally. That is that in physical project contexts they participate in team meetings and interact with team members.

Some firms believe firmly in the fact that employing motivated users rather than industry professionals or MBAs can increase creativity of the firm, because it is assumed that it is easier to teach a fun hog to be a businessman than to teach a businessman how to be a fun hog. Bring customers into your business webs and give them lead roles in developing next-generation products and services. This may mean adjusting business models and revamping internal processes to enable better collaboration with users. It certainly means avoiding practices of blocking, impeding or disabling customer innovations. Firms, however, must be aware that they do not have the same degree of freedom regarding customer co-creators as they often have with employees. Firing a customer participant may alter the demand for a product or loyalty. Also, firms must realize that customers want to be in control, denying any form of external control.

Initially, you may encounter customer resistance to the idea of such close collaboration. In that case, you must take time to educate them about the benefits of their presence.

Without the customer's full-time presence, the (rapid iterative) innovation process can not be executed successfully. A fully involved customer provides requirements when needed, answers questions immediately, and performs testing as soon as the latest iteration is available. Theoretically, with this approach, there is no delay at all. In such a case the company should take in mind that customers will need additional training and that they can understand the use and purposes of the tools.

The Class project is an experiment in technology innovation and engineering work practice that began in November 1989. The project is a joint undertaking of Xerox Corporation and Cornell University. The project aims at digitally preserving 1000 brittle books from the Cornell University libraries using Xerox proprietary digital-image technology and subsequently reprinted on acid-free paper and returned to circulation. It is the story of a participatory co-development project involving a commercial engineering team and an external customer. The team recognized the need to involve the users from the beginning in all planning and development activities. This was seen as a way to explore and discover requirements, while building working relationships among users and engineering-team members. Open and continuous feedback between users and engineers was necessary to support an iterative, evolutionary development, delivery, and evaluation process.

Several activities were undertaken in a collaborative way, and these laid the groundwork for building the working relationships needed. The initial phase of the project was to gather requirements and determine a plan of work and a schedule of deliveries. The first collaborative efforts focused on determining these requirements and plans. Joint meetings were held at the Xerox engineering lab and at Cornell (the sites are separated by nearly 90 miles). At first all members of the Class team and representatives of several different organizations at Cornell attended, but the work plan team was soon reduced to about six people, including two from Cornell. Collaborative-planning tasks included building engineering data flow diagrams for book preservation, observing current photocopy preservation activities, evaluating an existing electronic database of chemistry research journals, and critiquing UI storyboards. Many Cornell librarians participated in these activities. These interactions revealed the cultural differences between the library and engineering work.

A second collaborative activity was to include the customers (users and managers) in the monthly engineering project review meetings. This decision made the users privy to the internal workings of the engineering organization, and this led to several awkward incidents concerning problems that could not be solved immediately, leading to panicky situations for the customer, but for which the project team acted routinely (it takes some time to come with a solution, so be patient). It took some time for the librarians to grow accustomed to attending meetings filled with what seemed like only bad news. At one point they asked that the meeting agenda include some good news.

The third collaborative activity was to provide support for a prototype system 90 miles from the engineering lab. This support proved to be a significant challenge. It was resolved by providing a digital telephone pager that rotated through the engineering group; each member has pager duty for one week. The pager provided more than a simple technique for communicating problems and getting help. It opened up a channel for customer engagement that provided data about the design of the system and the way the users worked with it. Furthermore, the pager allowed all the team members to build individual social relations with the users. Since the 90-mile distance discouraged casual visits, the pager helped bring the two organizations together.

### **Prefer face-to-face communication**

When embarking on such a journey, companies will encounter many tools and methods. In all our cases, however, the most valuable experience for designers was the close, face-to-face interaction with users, allowing for a transfer of tacit knowledge. There are many ways to involve users in innovation, but it seems that all require some level of involvement by the designers themselves.

Communication also improves when the customer is located with the development team. Individuals can communicate in a direct and personal manner. There's no need to leave voicemail messages or swap e-mails; the customer is sitting right there with you. When a concept needs testing, the developers can look over the customer's shoulder. When problems arise, the project manager can discuss them immediately with the customer. Communication is fast and direct, reducing the opportunity for mix-ups.

Take caution on group dynamic effects that can have a negative effect on the contributions. Since this aspect is without the scope of this protocol, we refer to appropriate literature about group dynamics and group processes.

### **Stimulate/Activate participants to trigger insights through team playing**

Once you start to co-create, you have to stimulate participants to own the brief by showing you how they think, feel and experience, in order to discover trends and trigger valuable customer insights. From these insight triggers, participants, stakeholders and experts then should work together in constantly rotating teams to generate lots of disruptive ideas. As a group all the customers, stakeholders and experts select their most engaging ideas, before another team of customers then take these and refine them further. Once customers have refined the selected ideas they then pitch them to the core stakeholder team, who then make the final cut.

Allow for constant, spontaneous customer co-creation. Judge not your customer by the thickness of their wallet, but by the content of their contribution and desire for that contribution to be completely on their terms.

### **Summary of the protocol**

We can now summarize all these findings in some general do's and don'ts:

1. It does not matter in which industry or sector you are employed; your customers possess knowledge and experience about the use of your product, which you can harness for your NPD-initiatives. This will enhance the success of your innovation, and your customers' loyalty. The earlier you involve them in a certain project, the better the results will be.
2. Carefully decide on this customer co-creation by identifying in advance what benefits you want to get from this and whether your customers are easy to locate, access and cooperative. Communicate your intentions and objectives upon invitation. Be transparent about these. Do not underestimate their power to neglect or even undermine your invitation to participate, when you're not being open.
3. You can co-create with your customers in every phase of the NPD; you can use your own tools and techniques, as long as you do not make things too complicated for them. That means that you can train them in the use of these techniques – this will lead to better inputs from them. But keep in mind; it is not this toolbox that determines the success. Nor is it the technology – although engaging many customers at a time is enabled by applying online methods. It is the dialogue that you have with your customers that will do the trick. Therefore, use additional techniques

that facilitate this dialogue. In that respect, choose participants that are willing and able to take part in that dialogue.

4. Do not rely solely on a few important, financially promising or lead customers. On the other hand, do not think that a large amount of participants will always be helpful. Create a diverse participation by alternating customers in phase or activities of an amount you can handle. This will also prevent group thinking, the preference for one's own ideas or even boredom in a lasting process. In many online situations you might aim for a larger participation, but do this only when you do not have to handle their inputs simultaneously or have sufficient resources to handle this.
5. Customer co-creation does confer some distinct advantages. One of its greatest strengths may be that it feeds back to the customer what's been done with their own feedback (provided it's actually been incorporated). Too often, market research tends to be anonymous because people are worried personal data is going to be misused. Organizations have lost the ability to communicate back and say "thanks for your input, this is what we've done with it", and that's probably the most powerful incentive for people to participate in the first place.
6. Finally, treat your customer respectfully. Reward him properly and treat him as one of the NPD-team, by including him in decision-making, be transparent about royalties and (IP) rights. But, be certain that your whole organization adopts this attitude. Any mistake can be catastrophic for you customers' willingness to participate.

### Final remarks

If you have any comments, suggestions for improvement, new insights, etc., please be invited to submit these to the originator of this protocol. Also, if you have any trouble or problems in perceiving its value or application in your organization, notify us; we would be happy to help you out in finding the obstructions in perceiving its value for you. We also like to hear about your experiences in applying this protocol or alternative methods of involving customers in the innovation process. These comments, examples, etc. will be greatly appreciated to improve this protocol towards a robust, comprehensive and enduring protocol for organizations that want to include their customers in the new product and service development.

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### Design Proposition used in 3CI Protocol version 1.0

This 3CI-Protocol is based on an extensive research of theory and practice, which resulted in the derivation of potential *design propositions* or *design rules* – heuristic statements, also called *means-end statement* in the form of: if you want to achieve outcome Y in situation S, something like X might work or help. They tell us what intervention a player should use in the given context to realize the desired outcome. Design propositions are holistic. A given intervention is applied in a certain context and all organizational and contextual factors have an impact on its outcome. The description of proposition, context and outcome need not be reductionistic, but can use 'thick' qualitative text. However, there are certain conditions a design proposition has to meet. The key component of the design proposition is the intervention type I, a type of intervention or system to be used in solving the kind of problem in question. We add to this argument by raising the issue of causality, i.e. by asking through which generative mechanisms (M) the intervention produces the outcome (O) in the given context (C).

Mechanisms are used in several scientific fields, like philosophy, but haven't been properly defined. Mechanisms consist of component parts and their activities/interactions. They produce something. This production depends essentially on the hierarchical structure of mechanisms. Mechanism explanations are models of characteristics operating in organizational processes. It is always the combination of the component parts that as a whole activates the mechanism that produces the outcome, rather than any single activity alone. So, a mechanism is a plausible account of the process that causes a systematic relationship between variables. This addition results in design propositions following what we call the "CIMO-logic". This logic is constructed as follows: in this class of problematic Contexts, use this Intervention type to invoke these generative Mechanism(s), to deliver these Outcome(s)

Design propositions created in this way therefore contain information on what to do, in which situations, to produce what effect and offer some understanding why this happens. The design proposition is not the complete solution for any given business problem, it is merely one input to aid the design of the specific solution. Designing specific solutions typically demands much knowledge and expertise, such as knowledge of alternative design propositions with their CIMO-logic along with the evidence from field testing, as well as intimate knowledge of the local situation and business domain in question. The CIMO-logic constitutes only the logic of the design proposition, not its specific form. It is important to resist taking a mechanistic view, such as the prescription of a certain drug by a medical doctor to a patient, or the formula a civil engineer might use to calculate the maximum load of a bridge.

### ***The design propositions used in this protocol***

Design Propositions will be formulated as a set of sentences containing the four necessary components of the CIMO-logic, whereas C stands for context, I for (the set of) intervention(s), M for the generative mechanisms, and O for the expected outcomes. Design propositions will be numbered in sequence of development, while the CIMO elements will be similarly numbered, e.g. M2.3 for the 3rd mechanism in the 2nd proposition.

**NOTE:** The mechanisms that have been used in these propositions are grounded in theory and practice. The elaboration of these mechanisms is conducted in three chapters of the thesis, devoted to the development of these propositions. The reader that wants to understand how these mechanisms have been established is directed to the relevant parts of the thesis.

***Design Proposition # 1*** : Companies that are willing to and looking for proper ways to co-create with their customers in the innovation process (C1) can apply this 3CI-protocol (I1), because this protocol provides the appropriate routes and actions (M1) that lead to an effective input from customers (O1), needed to enhance the effectiveness (O1.1) and efficiency of the innovation process (O1.2). Process effectiveness is enhanced because (1) the innovation outcome is a product or service that is what customers want; (2) the innovation will be adopted quicker than without involvement; and, (3) being involved make customers more loyal to the firm. Efficiency is enhanced, because (1) costs will decrease; and (2) innovation development speed increases.

***Design Proposition # 2*** : In determining the proper innovation strategy for co-creating with customers in the innovation process (C2) companies should implement and maintain a market orientation, in particular a customer orientation (I2), because such an orientation aims at obtaining a deep understanding and increasing the knowledge about and from the customer (M2) that can lead to an effective contribution of customers (O2).

**Design Proposition # 3** : To support the development and maintenance of a customer orientation (C3), companies have to apply customer listening techniques, also known as Customer Knowledge Management (I3), such as ZMET□, outcome based methods and customer journeys, to properly understand customer needs and wants (O3), since these techniques go beyond traditional market research techniques and elicit latent and unarticulated needs and wants of customers (M3).

**Design Proposition # 4** : In determining whether the firm is suited for 3CI in the context of its industry, market maturity and type (C4), any organization, regardless of the sector it operates in, the type of product it produces (goods, services) and type of market (B2B, B2C) can co-create with its customers in innovations (I4.1), provided that the participants are given sufficient influence, power along with the necessary tools to make contributions (I4.2) and the firm is authentic and transparent in its appeal (I4.3). Because contemporary users are motivated and inclined to exert control over firm's offerings (M4.1), perceive personal benefits when asked to participate (M4.2), and perceive the firm as trustworthy and credible (M4.3) when modern technological applications are in place and the firm is benevolent towards the customers. With these interventions customers are empowered to participate in 3CI effectively (O4).

**Design Proposition # 5** : When looking for customer-initiated innovation ideas and contributions (C5) the firm has to create, maintain and support a user/customer community (I5.1) in which customers are/have been provided a base product or service (I5.2), with which they can freely experiment to re-innovate (M5.1), and where they can freely exchange and reveal (M5.2) their ideas, suggestions, and modifications to each other and the firm, which they deem necessary and beneficial to themselves, the community and the firm.

**Design Proposition # 6** : In creating and maintaining (online) innovation communities (C6) firms should consider design principles as giving and communicating purpose (I6.1), creating a dialogue through feedback and acknowledgement on contributions (I6.2), facilitating and encouraging customer-to-customer interaction (I6.3), distinguishing different and evolving roles (I6.4), keeping track of customer identities and contributions (I6.5), educating new participants (I6.6), and providing appropriate tools for contributions (I6.7) to achieve an active and productive community contribution (O6). These interventions (I6.1 – I6.7) in conjunction make transparent to participants what is expected from them (M6.1), give meaning to their contribution (M6.2), intrinsically motivates participation when a contribution is acknowledged and recognized (M6.3), create trust between members and between members and company through visibility and credibility (M6.4), make participants feel in control of their activities when educated and provided with tools (M6.5), and enable a proper appeal on contributions with consideration of an individual's abilities and previous achievements (M6.6).

**Design Proposition # 7** : Companies that want to co-create with their customers in a company-initiated innovation project (C7), should aim for an active participation (I7), i.e. informing the participants about the purpose, what is requested from them, procedures to be followed, and how the firm intends to use their contribution, because transparency removes barriers or inhibitions to participate, resulting in motivated, committed and satisfied participants (M7), so the most effective input will be acquired from participants (O7).

**Design Proposition # 8** : In determining the type of innovation, suited for customer co-creation (C8) the application of traditional market research and customer involvement tools (I8.1) are likely to lead to (at least) incremental innovation (O8.1), because the tools are suited to elicit customer articulated and identifiable needs that lead to minor or incremental improvement to existing products and services (M8.1). To



involve customers in incremental or sustained product, service and process innovations, adopting a customer orientation (I8.1), are the minimum requirements to warrant an effective customer input (O8), since these are the most suitable orientation and tools to effectively involve customers in innovations (M8). Application of customer listening methods, such as the outcome-driven approach, the metaphor-based interview, customer journey approach and/or netnography in the front end of the innovation process (I8.2) will more likely lead to really novel and radical innovations (O8.2) since these methods are capable of gaining access to tacit customer knowledge and ideas (M8.2), which are needed to develop a customer-centered radical or breakthrough innovation.

**Design Proposition # 9** : In determining the 'openness' of the 3CI-innovation (C9) firms should choose for the 'closed mode' of involvement (I9.1) when they have a clear scope of the innovation deliverables in terms of a concept, prototype or test ready product (C9.1) – thus typically in the implementation stage of the innovation - , a clearly defined and known market or customer, for which the innovation is specifically intended (C9.2), and IP-protection or non disclosure for competitors is needed (C9.3), because these conditions will limit the amount and diversity of participants to a necessary minimum (M9) , which is needed to ensure secrecy or closure throughout the innovation, in order for the firm to efficiently obtain the most relevant, specific and useful customer input for the innovation (O9).

**Design Proposition # 10** : When the innovation scope is unclear – typical in the conception and re-innovation stages of the innovation process - , the intended market unknown and project disclosure poses no problem (C10) firms can choose for the 'open mode' of 3CI (I10). In order to manage customer input efficiently (O10) for a 'totally open mode' involvement of customers, firms have to reserve sufficient resources (I10.1), divide the required customer contribution in 'digestible' and independent chunks for participants (I10.2), and engage participants through online and virtual channels (I10.3) because these actions enable the participation and management of a large group of participants (M10).

**Design Proposition # 11** : To decide on the type of customer to co-create with (C11), participating customers should be selected on their affinity with the domain in which the innovation will take place, meaning that they should have some experience in being a user of the product or service class (I11), so the firm can expect relevant and good input (O11). In this respect it is not necessary for the users to be an active or existing customer of the innovating firm. Experience with the domain is necessary, because only then will participants be able to perceive possible benefits from product or service improvements in the context of its use (M11).

**Design Proposition # 12** : In determining the technical expertise for Customer Co-Creation in Innovations (C12.1), firms can involve any customer that uses, has used or will potentially use the innovation or a related product (category), regardless of their technology skills or know-how (I12.1), since all (potential) customers are sufficiently knowledgeable (M12.1) to effectively contribute to the innovation process (O12.1), whether they are lead users or ordinary users. In the case of radical innovations in high-technology industries (C12.2) firms might consider a certain additional representation of lead customers/users (I12.2) to increase the chance on a really novel or radical innovation (O12.2), since lead customers are considered innovative and ahead of the market in the field of innovation (M12.2).

**Design Proposition # 13** : To find lead users in (online) customers communities (C13, O13), which can contribute in radical innovations (see Design Proposition # 12), the firm should observe and appeal on the whole community to identify motivated and capable participants (I13), since community members are knowledgeable about the community's lead users (M13).

**Design Proposition # 14** : In selecting and engaging the participants to participate in Customer Co-Creation in Innovations (C14), companies can increase the effectiveness of their contributions (O14) by screening and selecting potential participants on their motivation and willingness to participate (I14) because intrinsically motivated and voluntary participants tend to be more creative and contributing than when not motivated (M14).

**Design Proposition # 15** : When appealing on customer creativity in suggesting new product ideas or improvements (C15), firms should have other users and customers, which take part in the customer innovation community, to assist in the screening and assessment of the ideas (I15) in order to increase originality, novelty and creativity from the participants (O15), because creativity is highly determined by the social context it takes place in (M15).

**Design Proposition # 16** : In selecting and engaging the participants to participate in Customer Co-Creation in Innovations (C16), companies can increase the quality of their contributions (O16) by giving participants some training related to the contributions that are expected from them, the tools and techniques to be used, and interpersonal skills (I16) since these will increase the participants' perception of their capabilities to contribute and inherently their intrinsic motivation and willingness to participate (M16).

**Design Proposition # 17** : In determining the amount of participants in Customer Co-Creation in Innovations (C17), firms should aim at involving a maximum amount of participants in the early (conception) and last (re-innovation) stages of the innovation process through online channels (crowdsourcing) (I17.1) because many and diverse input is needed in these stages (problem solving) but where the maximum amount is dependent of what the firm can handle, given the chosen strategy regarding time, channel and global reach (M17.1). During the implementation and start of the commercialization stage a minimum amount of participants should be aimed at 15 participants, preferably physically present, per phase (I17.2), since this amount assures a representative quantitative view of possible customer inputs and limits the resources (prototypes, test versions) needed (M17.2). This ensures an efficient contribution (O17).

**Design Proposition # 18** : For firms that need to engage and motivate participation (C18) and ensure commitment throughout participation (O18), the assigned task for the participating customers has to be meaningful, challenging and relatively complex to them (I18.1), while its goals should be clearly specified (I18.2). By means of knowing what is expected from them (Design Proposition # 7) and the feeling of being in control (Design Proposition # 4) participating customers can assess the relevant valence emerging from their efforts, which is needed to feel motivated to perform (M18).

**Design Proposition # 19** : To motivate customers (C19, O19), which are involved in the innovation co-creation process (C19) into participating, no monetary reward has to be made in foresight (I19.1), whether on participating or completing the task, because this may undermine the intrinsic motivation that people may have for participating (M19.1). When monetary payments are promised and given (I19.2), these should preferably be administered contingent on the task complexity and the performance shown, since participants feel compensated for valuable time, costs and effort spent in participation and possible exchange of the right to exploit the solution by the firm (IPR), because these will be perceived as a recognition of one's abilities and commitment (M19.2).

**Design Proposition # 20** : When co-creating with customers in innovations in the front end activities like needs assessment, idea generation, and idea screening, design and concept development (C20), it would be better for the creativity of the participants (O13) not to promise any monetary rewards at all in advance (I20.1), and to reward

participants unexpectedly with intangible rewards (I20.2), because the expectancy of a monetary reward may reduce intrinsic motivation and creativity (M20).

**Design Proposition # 21** : In deciding on the timing of Customer Co-Creation in Innovations (C21), the firm should aim at involving its customers in an early stage, preferably at the start of the innovation process (I21), to increase the effectiveness of customer input in order to achieve the greater chance for success (O21), as customers' wants and needs are more likely to be incorporated in the innovation (M21).

**Design Proposition # 22** : In deciding on the timing of Customer Co-Creation in Innovations (C22), all innovation stages, phases and activities are suited to co-create with customers (M22) so firms can decide on co-creating with customers in only one, more, but preferably all stages and activities (I22) to achieve an innovation that is needed by the customers (O22).

**Design Proposition # 23** : In deciding on the participants in the different phases of Customer Co-Creation in Innovations (C23), firms that intend to involve the customer in more than one stages should avoid involving the same customer(s) in all these stages and should try to alternate customers per phase (I23), since involvement of the same customer(s) can lead to several counterproductive actions from these customers (M23) that may prove to be detrimental to an effective contribution (O23).

**Design Proposition # 24** : In deciding on the customers' contributions in the respective phases and activities of Customer Co-Creation in Innovations (C24) customers can contribute to innovation project activities as depicted in Table 12-3: Protocol – Phases, customer requirements, contributions, tools and techniques for involvement.. In these contribution contexts specific interventions (I24) and their mechanisms (M24), as proposed in previous design proposition are recommended as depicted in the table, in order to obtain an effective (O24.1) and efficient (O24.2).

**Design Proposition # 25** : When co-creating with customers in innovation projects (C25), companies can choose for both an online and an offline approach, and a combination of both approaches (I25), depending on available time, amount of participants, openness of the process, innovation process stage and available resources, since these factors determine the channel use as depicted in other design propositions (M25). Both customer interaction modes contribute to a fruitful collaboration between company and customers and an effective contribution (O25).

**Design Proposition # 26** : When appealing on (innovation) communities for innovation purposes (C26) companies have to apply crowdsourcing techniques (I26.1), tools that take the innovation phase, customer experience and expected contribution in consideration (I26.2), and community context or organization (I26.3) to maximize the obtained results (O26). Crowdsourcing enables a large and diverse reach in an efficient manner (M26.1). Appropriateness of tools can be evaluated by the adapted CIC-framework (M26.2), which asserts that contributions depend on the innovation stage, the abilities and capabilities of the participant and the required contribution. Providing the right context, i.e. the community type, is necessary since different innovation stages require different contributions and competences from participants (M26.3).

**Design Proposition # 27** : In determining the appropriate type and intensity of communication between firm and the participants (C27), the firm should treat the customers as NPD/NSD team members (I27) to obtain an effective contribution (O27), because direct contact with team members and equal treatment make relation as symmetrical and direct as possible enabling quicker, more and better exchange of ideas and contributions, without inhibitions (M27).

***Design Proposition # 28*** : To communicate with and between participants in innovation activities (C28) it is recommended to use a language based on metaphors, analogies and symbols (I28) to increase the creativity of participants and quality of solutions (O28.1), as well as the quality of understanding between company stakeholders and participating customers (O28.2). Metaphors, analogies and symbols enable the expression of latent and unconscious needs, requirements, solutions, and such (M28.1) and function as a universal language to bridge different (sub-) cultures (M28.2).

## **Appendices:**

1 - Intake

2 – Quick Scan

3 – Workshop Program

## **1 - Intake**

This intake (in the shape of a semi-structured questionnaire) is intended for the workshop facilitator to summarize some innovation characteristics of the company that has the intention of starting or contemplating an innovation project by involving its customers.

The intake can be executed either in a face-to-face interview, by telephone or by email, as long as it leads to the result that the workshop facilitator acquires a good impression and idea of the company's innovation attitude and characteristics.

### **Introduction, objectives**

Give a brief description of the objectives and procedures of this intake. Objectives: to draw up an inventory of the firm's innovation characteristics in order to determine the customer involvement opportunities in innovation projects.

Provide confidentiality of data and other information.

### **Context and business**

In what kind of business/industry is this company?

What kind of products or services does it produce?

In what kind of markets does it operate? Any specific target groups or segments?

Which customers' needs do its products or services fulfill? Why do customers need them?

Which important developments affect the business, market and company? Name the five most important ones and describe how they affect business, market or company.

How would you describe customers' satisfaction for your products or services? Please explain.

Is it possible to receive some documentation that describes the company's and business' specifics in more detail?

### **Innovation strategy**

Please state how important or relevant the following aspects are for the company's innovation strategy (categorize as Very Important or Not Important):

- Improving the performance of existing products or services
- Innovating radically
- Producing products and services that are needed by customers
- Cooperating with other firms
- Accessing new knowledge on market or technology
- Delivering new technologies
- Defeating competitors in the market in innovation speed
- Increasing profits
- Reducing costs of production
- Increasing quality of products and services

- Improving technological competencies

### **Innovation project**

What is the project, what is it about?

To which market segment and/or product category does this project applies?

What are the aimed timing and schedule for this project?

What are the respondent's own expectations of involving the company's customers in an innovation project?

What kind of customers is the company aiming to involve?

To what extent should the involvement be? Talk about: control, duration, channels.

What benefits does the company expect from this involvement?

### **Customer interactions**

What methods or procedures does the company already follow to interact or keep in touch with its customers? (Rate each item from Not applied to Intensive application)

- email and/or written contact on questions and remarks
- market research by own marketing
- outsourced market research
- user communities
- concept testing with customers
- customer observations (unobtrusive)
- site visits
- lead user involvement in NPD
- ...

### **Innovation management**

Which tools or methods does the company typically apply in innovation projects?

[LIST]

Does the company use some kind of staging/phasing of the innovation process? If yes, what stages are distinguished?

How do you decide on the suitability of a project idea, new product idea or innovation chance?

How do you decide on the marketability of the new product?

## 2 - Quick Scan

The following questionnaire is intended to establish the company's 'readiness' to involve its customers in an innovation project. All questions can be answered in Yes or No.

The questionnaire is based on projects by Altuition, like "Innovatie Loont", "Klanten Leer Centrum" and "Client Co-Creation Lab", and research literature on user or customer co-creation in innovations.

TEST: On this page you can test your organization's possibilities of implementing a customer involved innovation strategy! The questions are deduced from leading research and practice on customer driven innovation theory. The theoretic and practical foundation allows the company to estimate the possible benefits from initiating a customer involved innovation strategy.

In the end of the test a score will be calculated and the test will give you an indication of your organization's possibilities with implementing a customer involved innovation strategy. For each question answered with a "yes", 1 point is given. The end score will be between 0 and 13; a higher score means an increased benefit from launching a customer involved innovation strategy.

1. Do you find that your company is providing a unique product or service, or fulfilling a unique need in the market, that no one else does?
2. Do you usually surprise the market with new products and services?
3. Do you usually invent, design and develop new products and services without consulting your customers?
4. Is the technology that your company uses complex and hard to understand by your customers?
5. Are your employees, especially the product or service developers, more knowledgeable about the product or service usage possibilities than your customers?
6. Do you think that your company has a monopoly on the technology used in your products or services that no other firm can acquire without breaching of IP?
7. Do you think it is important to offer a large assortment of your products or services, in order to meet individual demands as much as possible?
8. Do you think it is necessary to innovate with secrecy and speed in order to keep competitors and others in ignorance?
9. Does your organization have customers or users that are at the leading edge of important trends in a marketplace?
10. Is it correct that customers or users have complained that there are flaws in the product or that you are responding too slowly?
11. Customers are increasingly asking for customized products?
12. Does your organization or your competitors use high-quality computer-based simulations and rapid-prototyping tools internally to develop new products?
13. Have you experienced that some of your costumers or users have suggested or even engaged in incremental or radical modifications of your product?

### **3 - Workshop Program**

1. Introduction and goals of the workshop
2. Benefits and disadvantages of customer co-creation in innovations
3. General theory and practice on involvement:
  - Participants' requirements
  - Phases / periods for involvement and the expected outcomes
  - Channels suited for this involvement
  - Incentives to motivate and reward participation
  - Special tools and techniques:
    - Which tools does the firm usually apply and are they suitable to involve customers
    - Which particular exceptions should be made for this usually applied set of tools
4. Deciding on customer involvement: points of consideration
5. Which persons or functions of the firm are going to participate, i.e. are exposed to the participating customers, conduct communication with customers, etc.
6. Closure of the workshop by setting out the actions customer involvement (making the plan).



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## Summary

The transition into the information revolution or age has made it possible for consumers and users to interfere in the conceptualization, design, production and sales processes of firms. Consumers and users can express their needs in more direct way to producing firms, they have access to the way products and services are made, and last but not least, have access to information on competing products and services that even producers don't know about. Consumers have become more knowledgeable and are therefore capable of designing and producing their own products and services.

The success of innovations or new product and service development is highly dependent on whether they take in consideration the needs and demands of potential users and consumers. In other words, a market orientation is essential for the success of an innovation. Firms would therefore welcome the idea of consumers and users expressing their demands and probably appreciate consumers who want to participate in the new product or service development, because they would have immediate feedback on the potential success of the innovation. Question is, however, how to achieve this and how to successfully co-create with customers in the innovation process.

This design research addresses customer co-creation in innovations for product and service industries. It addresses how firms should successfully activate customers or users and what process they should follow, i.e. the kind of customers or users to involve, the tools and techniques to apply, and procedures to be followed. It develops the appropriate interventions for this in a Customer Co-Creation in Innovations (3CI) - Protocol. The nature of this research is prescriptive, based on the Design Science principles, aiming to design a solution for firms that are interested in the co-creation role that customers can play in their organizations regarding innovations. The research results in a protocol which organizations that want to co-create with customers in their innovation process, can use or apply, to effectively co-create with these customers. Effectively in this sense means that the customer input will be of added value to the innovation, resulting in the outcome that the organization succeeds in bringing the innovation into the market or in use. This doesn't necessarily mean that the innovation will be a commercial success, because this success depends on more and other factors than just customer co-creation. But, in this context customer co-creation gives the organization the necessary confirmation that the innovation fits needs and demands in the market, and thus leads to a higher adaptation than one should expect when not co-creating with customers.

There is an abundance of literature that argue the benefits of involving customers in the innovation process, while other address the issue of which customers to involve, so, the research focuses itself on best practices, experiments, and such to develop this protocol. This has been accomplished by studying the diverse modes or appearances of customer involvement in product or service development, such as market research, empathic design, user-centered design, co-design, mass customization, user innovation, open source software development, user generated content, crowdsourcing, and customer co-creation. Although there is a lot of overlap and similarities among these modes of involvement, there are also many differences, indicating that customer co-creation in innovations is contingent on many factors and aspects. To reduce the confusion, a construct of *customer co-creation in innovations* has been developed, which has been defined as the process where product manufacturers and/or service providers actively engage with their end users or customers in (parts or phases of) innovation projects to jointly perform innovation activities and co-create value, with the aim of increasing effectiveness and efficiency of the innovation process. Effectiveness refers to (1) the result of meeting users' and customers' needs and demands in a better way; and (2) increasing customer loyalty. Efficiency refers to (1) the reduction of research and



development costs; and (2) the reduction of development time. And to analyze differences and similarities so that the appropriate design propositions can be stated, a 3CI framework was developed, covering the following topics: (1) how to determine whether a firm can co-create with its customers in innovations, which are the so called context conditions; (2) how to identify, select, and motivate potential customers to participate in customer-open innovations; (3) how to engage and involve these customers in the innovation process in an effective and efficient way, the process, procedures and methods one can follow, the tools one can use to accomplish this.

With this framework the practice of customer co-creation was analyzed by means of five case studies, in which two of them, the author was an actor in designing and executing the process of co-creation. The cases, selected for their diversity, reveal the opportunities and challenges of customer-inclusive innovation. Customer involvement was at least a partial success in all cases. At the same time, it was never a 'silver bullet' to permanently transform the way the company worked. 3CI seems to be capable to support both incidental and repeating innovation initiatives of a firm. Another observation is that, whether a B2B or B2C type of firm, a manufacturer or service provider, small or large firms, all seem to be capable of and suited for 3CI. Common in all cases, however, is that the organization's offerings and markets should be heterogeneous, thereby containing opportunities to either develop line extensions or really novel (radical) offerings. The technology base of the organization, however, does not seem to be a prerequisite. Another theme cutting across the cases is the nature of an 'innovation community', where users test, experiment with and modify or enhance existing prototypes and products, paving the roadway to innovation. As for the relationship between innovation type and type of customer, the cases undoubtedly demonstrate that 'ordinary' users can provide useful input to develop radical or novel innovations. The cases also demonstrate that nearly all innovation activities can be conducted by co-creating with customers, including needs assessment, ideation, the screening of ideas or concepts, concept testing, design and development, the commercialization of the innovation and even the re-innovation or use stage. So, although one could get the idea of 3CI being of particular interest in the front end of an innovation stage, we see that in all later stages 3CI can be beneficial as well. Typical across all cases is also the contingency of the channel of involvement (online versus face-to-face) with the amount of customers involved, which we have typed as the degree of openness. The more people are involved, the more open (no secrecy) the co-creation is and the more the involvement is obtained through the online channel, either with communities or on an open call. Conversely, the less participants, the more secrecy is needed and the sooner the physical presence or offline participation seems to be imminent in participation. Finally, regarding the use of tools it can be concluded that sophisticated methods for customer co-creation are a complement rather than the sole source of user information. More important seems to be the occurrence of a dialogue between firm and participating customers, implying that the quality of the interaction depends on mutual trust, appreciation, commitment and equality. Tools that support this dialogue, such as the ZMET™, OBR, or similar techniques, seem to be important to assure effective and efficient contribution from customers.

Subsequently, the design process was conducted, first by defining 16 design requirements for the protocol – subdivided in functional and use requirements, and design restrictions and boundary conditions – followed by the development of the design propositions. A grand total of 28 design propositions have been identified, regarding the context of 3CI (10 propositions), the customer requirements (10 propositions) and process (8 propositions).

The context propositions reflected the context decisions to be made, i.e. the appropriate strategy, the suitability of the firm's market, the initiator for the co-creation (firm or customer), and the type of innovation (incremental vs. radical, open vs. closed mode).

Wherever appropriate we have also reviewed the appropriate methods, tools and techniques for the best implementation of the interventions. These are the first decisions the firm has to make when undertaking the 3CI Journey. Only when these decisions are made a next step, i.e. determining which customer requirements are appropriate, can be made. It has been argued that any organization can co-create with its customers in innovations, provided that they adopt and maintain a market oriented strategy, along with the necessary tools, space, freedom and transparency for customers to participate. Customer co-creation leads to at least effective incremental innovations, but when the organization applies Customer Knowledge Methods it increases the chance for an effective radical innovation. If secrecy is required, a closed mode approach of co-creation can be followed, entailing that a minimum amount and diversity of external participants are involved, provided that there is a clear scope of innovation objectives and the market it is intended for. Finally, organizations can either rely on customer-initiated ideas or initiate an innovation itself. In the first approach the organization is recommended to create and maintain a customer community, which can be observed and interacted with to elicit the customers' ideas.

The 10 customer design propositions deal with the type of customers to co-create with in innovations and the available interventions to engage with and maintain involvement from the selected participants. We have argued that all (potential) customers are eligible to participate, as long as they have a certain use experience with the product, service or category of innovation. Only in the case of a radical innovation, the company can choose to add some lead users in order to increase the chance of generating really novel ideas or concepts. To find these lead users, the company can make an appeal on the customer community, since lead users are usually known in communities. In order to benefit in the best way from the participating ordinary and lead users, the company should select them on the basis of their willingness to participate. On top of that, participants should be trained or educated in the tools, techniques and methods that are applied during their involvement. To prevent a decrease of intrinsic motivation with participants, companies have to be very prudent with the promise and administering of financial rewards. Rewards can be given, but preferably unexpected and contingent on task complexity and performance demonstrated by the participant. Depending on the channel of involvement, a minimum of 15 to an undetermined maximum of participants is possible, provided that the company reserves sufficient resources to handle the amount of participants.

To our initial 20 design propositions we have added an additional 8 design propositions regarding the process of co-creation. We have seen that all innovation stages are suited to co-create with customers. For the appropriate activities in which these customers can contribute we have developed a table depicting activities and contributions per innovation stage. Co-creation can take place in one, more or all stages; to receive the most benefit, customers should be involved as early as possible in the innovation process. To prevent loss of attention, de-motivation and premature abandonment, we have proposed to change participants with ongoing activities; relying on the same customers in all stages can result in 'myopic' results. Both online and offline co-creation are possible, depending on openness, amount of participants and available resources. If participation is online, we recommend applying crowdsourcing methods and techniques, preferably within the customer community. To support an effective communication, we finally proposed to use metaphor or analogy based 'language' and to treat the participants as if they were team members.

Through scrutinizing and analyzing the 28 design propositions in relation to one another and some pre-defined design requirements, we have identified four main routes – metaphorically named the dreamcatcher, contest, touchstone and employment route – that a company can follow when aiming to co-create with customers in the innovation process.

The *dreamcatcher route* appeals on a user community – existing or yet to be created, preferably online, but with a physical possibility – where existing products, services or platforms are used, reviewed and discussed by customers. The company observes and participates in this discussion through a dialogue, possibly also moderating the community. Opportunities are identified by the company and translated into innovation projects by the company, in which customers again can participate. In the *contest route* the company can pose users with a specific question or request, a challenge, for which they are expected to think of a solution, of which typically one, or a limited amount of solutions are eligible. The intention is to specifically involve the customer in the front end of the innovation, because the company does not know or is not aware yet of customer needs and wants, or the intended product or service requirements. Customer input is then required in the first stage (Conception), but is not necessarily excluded in later stages, where customers can test prototypes, assist in the commercialization and the re-innovation. In the *touchstone route* the company can decide to co-create with customers in any, arbitrary stage or activity of the innovation process, a sort of a one off. In such a case, the company usually has already identified the opportunities, the innovation project and its goals. Customer co-creation is opportune to verify assumptions, fill in details, and provide additional, not thought of product or service requirements. Of course it is possible to co-create with the customer in more than one activity, but this approach is seen as discrete co-creation activities to support just that particular and specific stage, in which the co-creation is required, usually in the implementation stage and thereafter. Finally, in the *employment route* the company can integrate one or more (limited amount of) customers in the innovation project, e.g. by temporarily employing them. This approach is of particular interest in idea generation, design and development activities, i.e. the Conception and Implementation stage, but later stages aren't excluded. We can see this approach applied in customized projects, where it is the intention to create something for a specific set of customers or segment. This can be on request by the customer or because the company has discovered an unfulfilled or unattended set of needs with these customers, e.g. through dreamcatching.

To decide which route(s) is or are appropriate we have discussed some premises and considerations – objectives for co-creation, stages and contributions for co-creation, type and openness of innovation – that a company has to assess systematically. Each route was elaborated on, providing preparation steps and do's and don'ts for an effective and efficient contribution from customers. The four routes are also interrelated and do not exclude one another, but nevertheless provide a company with the optimal approach for 3CI. The 3CI-protocol is therefore a robust, handy guideline for companies to co-create with their customers in innovations. Because of the systematic and rigorous analysis and synthesis of theory and practice, the protocol can be applied in most situations.

To test and prove the correctness of this last assertion we validated the design by having it reviewed by some potential users, some experts and some scholars, and to base the conclusion of its validity on the opinions of these reviewers. A total of 25 potential reviewers, both national and international, consisting of product/service developers, co-creation intermediaries, consultants and scholars were approached independently from and 'blind' to each other to conduct this review. Ten of them consented in participation; three abandoned the review process prematurely for personal reasons, leaving a total of 7 reviewers that have submitted comments. It was agreed on to enhance the review with a Delphi if responses were very divergent.

All reviewers found the protocol useful and helpful for guiding the process of customer co-creation. Comments or critique referred mainly to the readability of the protocol, with the remark that users might lose attention because of the academic reasoning. Some of them provided useful additions to the protocol in order to enhance the readability. Also, suggestions were made to promote the protocol to practice, for instance by publishing it

via a community and a management book. The comments did not contain divergent viewpoints on the subject, the design and its content, so the Delphi was left out.

Based on these comments and suggestions by the reviewers, we have redesigned the protocol into the 3CI Protocol version 1.0, which can be published as a separate document, detached from this thesis, which all potential users can get hold of and apply without having to acquire a copy of the thesis. We propose to use this protocol to further validate it in practice and giving us feedback on its effectiveness.

Our main contribution to research in management and organization has been to develop a comprehensive *how-to* guideline for practitioners, based on and grounded in a diversity of theory. Therefore, we believe that we have contributed with a design that is applicable in all kind of business and organizational contexts where the interaction with end users is aimed at developing new offerings. However, modesty is also in place, when we observe that this has to be proven, yet. Further research can be aimed at obtaining this proof, while other research could focus on the underlying assumptions, which we named generative mechanisms, of the design.

## About the author

Marcel Weber was born on November 9, 1953 in Curacao, formerly the Netherlands Antilles, where he was raised and educated during his first 16 years. After finishing high school he moved to the Netherlands to follow an education and career in the Royal Dutch Air Force. After completing a 5-year officer training and education at the Royal Military Academy in Breda in 1975, he served over 25 years as an officer in aircraft maintenance and logistics in the Royal Dutch Air Force. In the last ten years of his air force career he specialized in total quality management, process improvement and customer focus, and was involved in several organizational and process redesign and development projects which took place in the Dutch Armed Forces during the 90's. He graduated in 1997 as a MSc in Strategy, Organization and Management Science at the Open University in the Netherlands. In 2000 he resigned from the Air Force to join Altuition where he presently holds a position as a senior consultant. Altuition BV is a consultancy specialized in the design and redesign of commercial processes, which consists of advising and supporting its clients in programs for customer insights generation, customer interaction design, customer retention and new business, product and service development.

His publications entail several conference papers on the subject of Customer co-creation in innovations for conferences as the Mass Customization and Personalization Conference (MCPC), the Mass Customization and Personalization conference for Central Europe (MCP-CE), the International Conference for Mass Customization (IMCM) and the International Conference for Management of Innovations and Technology (ICMIT). The paper for the ICMIT 2008 (Bangkok, Thailand) was selected for publication in the International Journal of Innovation and Technology Management (IJITM) and is forthcoming in 2012. He also authored a chapter (co-authored by Simone Geerts) for the Handbook of Research on Trends in Product Design and Development: Technological and Organizational Perspectives, a book edited by Arlindo Silva and Ricardo Simoes, which was recently published.

