# The Role of ICT in the Value Co-Creation Process

**Darius Pacauskas**

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# The Role of ICT in the Value Co-Creation Process

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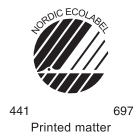
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**Abstract**

Value co-creation and the tools facilitating value co-creation activities have gained increasing interest from both information systems (IS) scholars and business practitioners. Based on extensive literature review and empirical research, this study investigates the role of information and communication technology (ICT) in value co-creation process. This study aims to answer the main research question – "how does ICT affect the value co-creation process", by addressing three topical issues: (1) type of information and communication technologies and their impact within co-creation activities; (2) co-creation approach and tools used for implementation of these activities within organizations; (3) ICTs usage for supporting outcomes of co-creation activities. These issues are examined in four separate essays included in this dissertation.

First, the study draws a broad picture of co-creation and its tools, highlighting its benefits for the stakeholders. Second, exploring product development processes and various viewpoints of social media experts, this study describes the practices used in companies to adjust its organizational structure for implementing co-creation activities through social media. Finally, this research discusses the design of co-creation tools for their users to support the outcomes of value co-creation by collecting and analysing previous findings with meta-analytical structural equation modelling and case study analysis.

This study makes several contributions to theory and practice. Overall, it adds to the understanding of how IS is used, designed and implemented in the value co-creation process to achieve various benefits. Also, based on the analysis, this study showcases that ICT used in co-creation works strengthens the processes, support individuals' creativity and affect products adoption.

# Acknowledgment

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# Table of Contents

## List of Tables

## List of Figures

4

# List of Original Articles

I.     Pacauskas, Darius, "ICT's Role in Value Co-Creation: Literature Review and Future Research Agenda" *(Submitted to an international journal).*

II.    Pacauskas, Darius; Durgam, Pradeep, and Fomin, Vladislav V., "How Companies Can Modify R&D for Integrating Social Media Activities into the New Products Development" (2014), *BLED 2014 Proceedings. Paper 39.*

III.   Pacauskas, Darius; Rajala, Risto; Westerlund, Mika; and Mäntymäki, Matti, "Leveraging User Innovation with an Online Communication Platform: Case Study of a Crowdsourced Hamburger" *(Submitted to an international journal).*

IV.   Pacauskas, Darius; Rajala, Risto, "Pacauskas, D., Rajala, R: "Information System Users' Creativity (Forthcoming): A meta-analysis of the link between IT use and creative performance." *(Forthcoming in Information Technology and People journal).*

# PART I: SUMMARY

# 1.INTRODUCTION

A while back, Henfridsson and Holmström (1999) presented the results of a case study on customers creating products for themselves. The case study described the activities of the gaming company DayDream, where game users were involved in testing online games and in advertising them – activities that even nowadays are frequently performed solely within companies. Other researchers have explored similar cases (Kambil et al., 1999; Wikström, 1996), contributing to the development of value co-creation lenses (Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2004). While value co-creation was a new perspective at the time, it did not make many new contributions to the core idea of marketing (Wikström, 1996). From its beginning, marketing's aim was to recognise users' needs and satisfy them. Value co-creation emphasises the same. However, the perspective did suggest a novel way to reach the objective – involving a product or service users in the development phase. Interaction between customers and producers should generate more value than via the traditional approach – i.e. only meeting when a product is finished, exchanging goods at that time, and then going their separate ways (Wikström, 1996). Value co-creation makes it possible to recognise customers' needs and tailor products according to their preferences, thus facilitating a positive experience not only during consumption process, but also during new offerings development for them (Füller et al., 2011). This leads to increased value for customers, for which they are willing to pay an additional price (Franke et al., 2009)

The Internet plays a big role in co-creation and it applicability. Since its early days, the Internet has transformed the marketing efforts of organizations (Prahalad & Ramaswamy, 2004; Sawhney et al., 2005). This involved two waves

of change. At first, the "Internet was seen as a tool helping to push more information to the consumers of products and services"; however, afterwards its usage changed from pushing information to customers towards knowledge exchange with the customers and facilitating knowledge exchange among customers (Erat et al., 2006). Such collaboration made it possible to use customers as co-developers (Prahalad & Ramaswamy, 2000). This occurred because of widely adopted digital communication that enabled individuals to connect themselves to networks and communities (Ind et al., 2013).

Aside from the huge number of possibilities, there is still one important issue related to whether or not a company will start co-creating with its customers – the low probability of customers developing solutions solely by themselves, which could give them a competitive advantage. Customers working either individually or together in a virtual environment have capabilities to develop promising solutions, but this process requires more effort from individuals than just sharing their ideas (Malhotra & Majchrzak, 2014). On the other hand, co-creation does not need to result in breakthrough solutions in order to bring benefits for companies. Wisely developed co-creation activities can do important marketing work. Positive experiences can change customers' perceptions and their behaviours toward companies and their products (Füller et al., 2011; Oestreicher-Singer and Zalmanson, 2013).

Whatever the case, customers need to be assisted in the value creation process (Vargo et al., 2008). Here, ICT can provide important help. Technology's potential impact on the co-creation process has long been recognised (Wikström, 1996). Co-creation can be done offline using pen and paper, but the use of ICT gives a tremendous boost to the number of customers that can be reached and to the quality of co-creation outcomes (Piller et al., 2012). By providing tools and systems, companies enable customers to develop solutions, which they could not do before, and at the same time, through IT-based interactions keep the cost down and thus make the work logic more viable (Wikström, 1996).

There are various tools to help users communicate, collaborate on, co-design, customise and co-create their needs, wants, ideas and solutions (Antioco et al., 2008). The tools can have various forms, ranging from a simple mailing list to more sophisticated customisation toolkits (Nambisan, 2002). While ICT has a large impact on co-creation activities, what is still not clear is how it can be designed and its role in the whole co-creation picture.

## 1.1 OUTLINE

The role of ICT in the value co-creation process can be studied in two general ways. First, by paying attention to the participants involved in the co-creation process – (1) the users of the outcomes developed, which can be end customers, business customers, companies' employees or citizens, and (2) the producers of co-creation products, which can be companies and governments. Second, by concentrating on the new product development (NPD) process, and especially on particular stages, which progress from ideation to marketing and for which different technologies can be used. Therefore, for studying the role of ICT in value co-creation the main research question is as follows: *How does ICT affect the value co-creation process*? This question can be divided into several smaller ones that address product development and different participants' concerns with respect to co-creation:

- RQ1: What are ICTs and what is their role in value co-creation? (*article 1*)
- RQ2: How does the use of value co-creation and ICT change a company's internal R&D processes? (*article 2*)
- RQ3: How can ICT affect users' outcome developments during different NPD phases and value creation? (*articles 3 and 4*)

USER

| Front-end NPD | Back-end NPD |

*RQ2*: How ICTs can affect users' outcome development in different NPD phases?

ICT

*RQ1*: What are ICTs and what is their role in value co-creation?

*RQ3*: How usage of value co-creation and its' ICTs changes internal companies' R&D processes?

Internal R&D processes

COMPANY
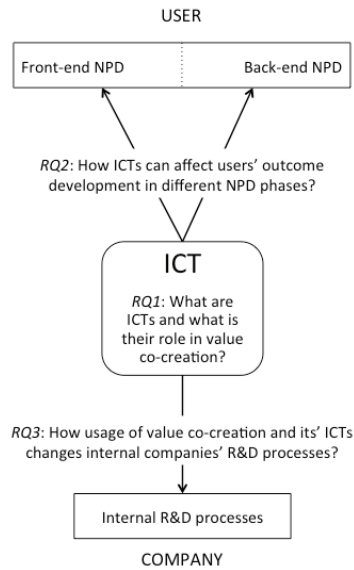
**Figure 1 Research setting**

In order to answer these research questions, the thesis is divided into four chapters. Each of the chapters describes different issues; however, they follow a particular sequence, and by the end, the thesis provides a broad picture of the issues at stake.

*RQ1 and article 1.* Value co-creation has received a great deal of attention from scholars recently. The tools assisting in the co-creation process were taken into account as well. However, to the author's best knowledge, a general explanation of the role of ICT in co-creation is still lacking. Some research has recently been done with respect to this research problem. For example, Zwass (2010) explained the co-creation process in general and Nambisan and Nambisan (2008) categorised the different platforms used in the co-creation process. But overall, researchers have been concentrating on separate features of the co-creation tools, thus leaving plenty of scattered evidence. To tackle this gap, the article reviewed the existing literature in an effort to gather and synthesise evidence and better understand how the role of ICT in the co-creation process has been studied. It also assessed

the benefits that ICT gives to each participant and how to define and categorise co-creation platforms.

*RQ2 and article 2.* Prior to adopting open innovation, companies used to handle all NPD activities internally within their organization. Adopting an open-innovation approach and integrating customers into NPD introduces changes to ordinary processes. While much is known about the benefits that co-creation can give to companies, there is no up-to-date research explaining how the adoption of co-creation is changing processes within companies (Aral et al., 2013). Therefore, the aim of the second research question was to provide knowledge about the changes within various companies' R&D processes after they had adopted social media and used it for value co-creation.

*RQ3 and articles 3 & 4.* Both articles shift the focus from companies towards users. Customers can be integrated during various NPD phases, and a great deal of support comes from using ICT (Nambisan, 2002). In the first stages of product development, new ideas and concepts are created. The customers' level of creativity is the key question during these initial stages. ICT can influence users' creativity (Khalil, 1996), and thus it can make the co-creation process accessible for a broad audience. However, it is still not known how exactly technology makes a difference in the creative process (Seidel et al., 2010). One aim of the third research question was to open a black box and explain why and how information systems affect users' creativity.

Another aim of the research question was to study the impact of technology during later stages of NPD, where marketing activities tend to occur, and understand how it impacts value creation processes. While front-end product development has received much attention from scholars, studies on back-end product development have received scarce attention and are mostly based on anecdotic evidence. Although the integration of customers into NPD affects their relationship with both the product and provider (Franke et al., 2009), relatively little is known about how tools can support these outcomes. This part will deal with a successful customer integration approach that allows achieving positive business outcomes and will analyse the impact of the platform used in the activities.

The rest of the thesis is structured as follows. The next chapter positions the study and discusses the main concepts used in the thesis. The third chapter presents the research approaches and describes the methods used in each part of the study. The fourth chapter presents the results from each of the articles and discusses them. The final chapter discusses the theoretical and practical implications as well as the limitations of the study and topics for future research. The original articles are attached as appendices.

# 2. THEORETICAL BACKGROUND

## 2.1 Value co-creation

Marketing has shifted from its dominant logic, in which tangible output and discrete transactions are central, to service-centered dominant view, where the exchange of core intangibles such as specialized skills, knowledge and processes (Vargo and Lusch, 2004). However, this doesn't mean that there is no place for tangibles in the market. According to service-centered dominant view, customers do not buy goods or services, but they buy offerings. Whether it is activity or a thing, both render services creating value (Gummesson, 1994). A service is defined as the application of specialized competences – mental and physical skills through actions, processes, and performances for the benefit of another entity or the entity itself (Vargo and Lusch, 2004).

Differences in these two logics can be better explained by looking into two types of resources. Operand resources, are resources on which action is performed to produce an effect, e.g. land as an operand resource; on the other hand operant resources are employed to act on operand resources or also on other operant recourses, e.g. skills and technologies (Vargo and Lusch, 2004). While good-dominant logic perceives operand resources as the key to the success of the business, service-centered dominant logic perceives operant resources as primary to obtaining competitive advantage. Skills or capabilities related to market-sensing, customer-linking and channel-bonding are operant resources (Day, 1994).

The goal of a firms marketing activities are changing from the classical producer-customer exchange towards a continuous series of social and economic

processes that is largely focused on operant resources intending to make better value propositions than its competitors (Vargo and Lusch, 2004). Superior value propositions relevant to the supplier's target customers should result in greater opportunities for co-creation resulting in benefits being received by the supplier in form of revenues, profits and referrals (Payne et al., 2008). Service-centered view perceives marketing as continuous learning process for better customer service, based on financial and the performance feedback that the firm receives from the market. Therefore, the firm can develop only a value proposition, but the user determines the value of the offering through its consumption(Grönroos, 2008).

Value creation is maximized through iterative learning process that happens between the enterprise and the consumer (Vargo and Lusch, 2004). The interaction doesn't end with the product delivery for both parties. The customer still learns to use, maintain, repair and adapt the product. At the same time, the firm learns and keeps refining the value proposition through received financial feedback (Vargo and Lusch, 2004). Therefore, value is co-created jointly and reciprocally through interactions between providers and beneficiaries. This co-creation happens through the integration of resources and application of competences (Vargo et al., 2008).

Service-centered view implies that the goal is to customize offerings, to recognize that the consumer is always a co-creator and to strive to maximize consumer involvement in the customization process in order to fit his or her needs (Vargo and Lusch, 2004, 2008). However, because of industrial society's increasing division of labor, its growth of vertical marketing systems and its large bureaucratic and hierarchical setup, most employees, in general, have stopped interacting with their customers (Webster, 1992). This has lead to the increase of the distance between customer and producer treating customers like resources that need to be captured or acted on (Vargo and Lusch, 2004). This would seem acceptable in an environment where users' needs and desires are stable. However, standardized goods produced without consumer involvement not only add to marketing costs but are often extremely perishable due to changing consumer needs (Vargo and Lusch, 2004). Thus, in a dynamic and evolving competitive market the firms that learn about the customers are the firms that do the best (Dickson, 1992). The more customer-voice companies can hear, the higher value proposition can be produced. On the other end, customers can and want to be involved into production of the value proposition (Prahalad and Ramaswamy,

2000). This can be done by integrating mass customization and relationship marketing that can lead to interactively design the offerings that meets customers' changing needs (Vargo and Lusch, 2004). Therefore, customers' role is changing from a target towards an operant resource, who can be involved in a continuous dialog with suppliers during each stage of product design and product delivery (Payne et al., 2008; Vargo and Lusch, 2004).

NPD teams are increasingly seeking out external resources to overcome the learning curves related to new technologies and new markets (Schilling & Hill, 1998). The role of the customer as an external resource for NPD has been recognised both in theory and in practice for a long time (Nambisan, 2002). Customers can have various roles in developing products, which makes it possible to integrate them into various stages of NPD. Customers can serve as product conceptualizers, designers, testers, support specialists and marketers (Nambisan & Nambisan, 2008). Some examples should be mentioned to give a better picture of this process. One of them is the case of Swarovski. Individuals were approached and invited to a virtual space to use a customization tool that had been prepared in advance. Their aim was to create a design for a wristwatch embedded with Swarovski gems (Füller et al., 2011). There is another approach called netnography, which is less intrusive (Kozinets, 2002). The Nivea company was seeking to develop a new product, and thus it browsed virtual customers' communities. It was found that users were unsatisfied with the stains that deodorant leaves on black and white clothes. The company addressed these needs and developed a new product to satisfy disappointed users; moreover, it let the people know about this development through virtual communities (Bilgram & Bartl, 2011). Therefore, the producer either empowers its customers to develop a solution by themselves or equips them with the tools necessary to transfer their knowledge into the company's domain (Piller et al., 2012).

## 2.2 IS and co-creation

In exploring value co-creation one of the big emphasis is on 'how does information technology influence the ways where value can be created effectively' (Vargo et al., 2008). Platforms play a large role in involving users in the co-

creation process. Platforms are the places where users gather to co-create. Such virtual environments for co-creation offer new avenues for openness by providing access to social media, i.e. content and interactions that are created through the social interaction of users via highly accessible, Web-based technologies (Bertot et al., 2010). Such technologies include the Internet, groupware, multimedia, streaming video, intelligent agents, virtual reality tools, and interactive sensory peripherals (Nambisan, 2002). A combination of the aforementioned parts helps to provide a range of services, including discussion and message boards, e-mail and mailing lists, product/technology knowledge centres for web-based games, customer design forums and virtual prototyping tools (Dahan & Hauser, 2002; Nambisan, 2002). These tools can be created and facilitated by companies or by users themselves (Zwass, 2010). Co-creation platforms can take different forms. One example is a simple online discussion board, where users can create a thread and provide comments (Nambisan, 2002). A more sophisticated tool can be developed for a particular NPD stage, for example ideation. Consider Dell's "ideastorm" (Di Gangi & Wasko, 2009), where users post ideas for improving or launching new products, then comment on them and vote on them. There can even be more advanced approaches, where users are equipped with product design tools, like in the Swarovski watch competition. In the Swarovski case, various amateurs and professional designers used tools provided by the company to design the desired watch from its different parts (Füller et al., 2011). A platform can also be perceived like a game. A good example is the case of the Smart company, where users submitted various custom designs for a Smart car, and by having the feeling to play evaluated them (Birke et al., 2013).

Co-creation platforms can help to integrate end-users into the five different stages of NPD, namely *(1)* ideation, *(2)* design, *(3)* testing, *(4)* support and *(5)* marketing (Nambisan, 2002). Each of the five stages brings different value for a company and different experiences for users (Nambisan & Nambisan, 2008). Roughly speaking, these stages can be divided into two parts – *(1)* front-end innovation, where the idea for and prototype of a product are created, and *(2)* back-end innovation, where the product is tested, advertised and supported (Koen et al., 2001). Design or idea competitions belong to the first stages of the NPD process. Their aim is to collect users' ideas, or prototypes, which can then be developed using the customization tools provided or an environment that facilitates the sharing of ideas. Examples include the aforementioned cases of Swarovski and Dell's "ideastorm". Starbucks's "mystarbuckidea" (Gallaugher &

Ransbotham, 2010) can also be mentioned in this context. Additionally, third parties can provide platforms that are used to employ creative users for solving various companies' defined problems, e.g. Eyeka.

Platforms for back-end innovation deal with product testing, support and marketing issues (Piller et al., 2012). Platforms help collect people in one place, where they can interact and share knowledge related to product usage. Platforms provide an easy-to-use environment for understanding the prototype and allow people to provide feedback on the prototype or the new product's features. Platforms can also generate content that attracts other consumers to use products or services. One example is Microsoft's virtual forum. It works as a question and answer space and is a place for users to gather and share problems related to Microsoft's offerings. Microsoft acknowledges users who have helped the most and shares their contact information with other people, thus satisfying users' recognition needs and helping other users to solve problems while at the same time reducing its investment in product support (Nambisan & Baron, 2007). Another example is "Clusterball", an online game released by the Day Dream company. The company first released a beta version of the game. Early users were asked to find flaws and errors in the game, and the majority of the problems were identified in a single day. Additionally, the company equipped users with their own personal space, where they could share their achievements and other game-related content, thus generating information and attracting other users (Henfridsson & Holmström, 1999).

While platforms can give a big boost to the co-creation process, it is still not clear what their role is in the big picture of co-creation (Majchrzak & Malhotra, 2013). When considering the field of IS, scholarship has only to a limited extent engaged with the broader phenomenon of open innovation (Ebner et al., 2009). Except for studies by Feller et al. (2011) and Leimeister et al. (2009), studies on software design, user interfaces and practices that facilitate the co-creation process are scarce (Majchrzak & Malhotra, 2013).

Since co-creation platforms can benefit both phases of NPD, front-end innovation and back-end innovation, it is important to understand on how customer related business processes can be supported for sharing their needs and

desires and how their relationship with the products or services can be facilitated with help of ICT.

Payne et al., (2008) proposes the framework and identifies two main actors in value co-creation – consumer and organization. Additionally, types of processes are identified in which these actors participate, namely– *customer value-creating processes*, *supplier value-creating processes*, *encounter processes*. These processes include the procedures, tasks, mechanisms, activities and interactions, which support the value co-creation and the need to see a long term interactive relationship between the provider and the customer performed using tools and practices. *Customer value-creating processes* relate to resources and practices that the customers use to manage their activities. In *supplier value-creating process*, a supplier uses the resources and practice to manage their business and its relationships with customer and other relevant stakeholders. In *encounter processes*, interaction and exchange that take place within customer and supplier which needs to be managed to develop successful co-creation opportunities.

## 2.3 Encounter processes

Service-dominant logic suggests that producer should identify core competences, skills & technologies, business routines, actions and operations that are tacit and idiosyncratic for his competitive advantage (Vargo and Lusch, 2004). And here the customer is one of them, as they act mainly as an operant resource. Interaction with the customers for customization & co-production of value proposition are the hallmarks of a service-centered view. This is because the customers' point of view improves the front-end process for identifying customers' needs and wants (Lusch and Vargo, 2006). Value co-creation begins with the interaction with the customers for solving customers' problem. On the other hand, producers' role is to assist the consumer in the process of specialization and value creation (Vargo and Lusch, 2004). For engagement within the front-end NPD process an 'encounter' must happen between supplier and the customer. In this sense 'encounter' is collaborative practice where the parties jointly perform activities (Payne et al., 2008).

Many researchers agree that only creative users can contribute to NPD (Morrison et al., 2004). This becomes a problem if we would look at the proportion of creative users in relation to ordinary users. Forrester's research showed that only 1% of all customers are creative enough to deliver an innovative

breakthrough (Williams et al., 2011). Nevertheless, creativity does not seem to be determined by an individual's skills. If we ask creativity consultants, we will receive the answer that only 6% of creativity depends on the person while the other 94% depends on the process and system (Burroughs et al., 2011).

While the ineffectiveness of integrating the majority of product users strongly impacts possible co-creation outcomes, the use of IS systems in the co-creation process can make it possible to solve this issue. It is widely accepted that IT tools can increase an individual's creativity (Edmonds et al., 2005). Researchers have studied different IT tools, checked their influence on user creativity and, in general, proved that there is a link between IT tools and creativity (Khalil, 1996; Martins & Terblanche, 2003; Shattow, 1996). Unfortunately, IT tools are still treated as a black box and scholars have not found an explanation for the relationship between tools and creativity at this point (Seidel et al., 2010).

Yet, we do know something about why and how technology influences creativity. IT can be employed to accumulate information on the knowledge of particular individuals and the availability of various means (e.g. computer, Internet) to exploit it. IT can thus support the creative and innovative process (Martins & Terblanche, 2003). Moreover, IT can support knowledge flows among individuals and it can make it easier to transform an individual's knowledge into creative solutions (Adamides & Karacapilidis, 2006). If we look at the existing IS literature, we find that scholars have proposed similar benefits for IS. IS may have either utilitarian purposes, i.e. perceived usefulness by users, or hedonic purposes, i.e. perceived pleasure (van der Heijden, 2004; Wang & Lin, 2012). Therefore, information technology (IT) can support creativity on at least two distinct levels: first, it can assist creative individuals in collecting, sharing, exploring and integrating knowledge during the process of generating creative ideas (e.g. knowledge management systems); second, it can be directly applied in the process of designing creative products (e.g. tools for computer-aided design), i.e. motivating the user to continue (Greene, 2002).

In one part of this thesis, we took the aforementioned explanation as a starting point and developed a model that explains why and how IS affects an individual's creativity.

## 2.4 Customer value-creating processes

Service dominant logic suggests to cultivate relationships that involve the customers in developing customized competitively compelling value propositions to meet specific needs (Vargo and Lusch, 2004). Value for customers is created throughout the relationship and sometimes in interactions between the customer and service provider. There is a need for a communication process that involves dialogue, asking the right questions and answering to questions. Prahalad and Ramaswamy (2000) argue that consumers are increasingly initiating and controlling this dialogue process. One key aspect of the customer's ability is to create value in the amount of knowledge, skills and other operant resources that they can access and use (Payne et al., 2008). However, value can reside not only in functional usage of product or service, but also in non-utilitarian aspects i.e. in the experience of consumption (Payne et al., 2008). This type of consumption include the flow of fantasies, feelings, and fun (Holbrook and Hirschman, 1982). Consumers often consider the issue of experience when searching for products, shopping, purchasing a service or consuming products (Ueacharoenkit & Cohen, 2011). Consumers perceive such experiences in either a direct or indirect way. Product experience directly affects customers when there is physical contact with the products and indirectly via advertisements or word of mouth (Brakus et al., 2009). Co-creation activities can be considered one type of indirect experience. This results in customers fully understanding the supplier's value proposition and also being attracted to it. They also engage in new types of behavior where they relate value proposition to their lives, objectives and aspirations (Payne et al., 2008).

A compelling and enjoyable creative experience is considered to be an important factor in evoking participants' interest in idea and design competitions and in supporting them when generating creative contributions (Füller & Matzler, 2007; Nambisan & Nambisan, 2008; Prahalad & Ramaswamy, 2003). Users may engage in value co-creation if companies succeed in creating an experience that motivates participants to continue co-creating in a virtual environment (Füller et al., 2011). Co-creation provides plenty of creative activities, and individuals engage in such activities because they look for experiences that provide such feelings as competence, autonomy and task enjoyment (Dahl & Moreau, 2007).

Users' perceived experience can be separated into single and overall experiences. A single experience, e.g. when faced with a particular product or service; helps form overall experiences with respect to that particular product,

service or company. Overall perceived experience helps determine perceptions about future single experiences with respect to new products or services (Roto, 2006; Salo, 2013). Therefore, a perceived positive experience based on a co-creation activity will affect a user's attitude to other products and brands. Academics have both highlighted the need for a compelling co-creation experience and acknowledged the positive relationship aspect via a number of post-activity outcomes (Füller & Matzler, 2007; Nambisan & Nambisan, 2008; Oestreicher-Singer & Zalmanson, 2013; Prahalad & Ramaswamy, 2003). Satisfying user needs and a positive experience stemming from co-creation activities will lead users to increase their product consumption and give them more incentive to purchase them (Franke et al., 2009). Moreover, online idea and design competitions enable corporations to be perceived as customer-oriented and innovative, which further strengthens their brand and increases customer loyalty (Pfeil & Zaphiris, 2009). Additionally, when participants see that their ideas and suggestions lead to action on the part of the company, they feel like an insider (Porter & Donthu, 2008). When looking at the marketing literature, and especially at brand communities, which is one place out of many where co-creation activities occur, we find that consumption in brand communities affects people's decisions of whether or not to buy the products (Adjei et al., 2010; Schau et al., 2009; Veloutsou & Moutinho, 2009; Weiss et al., 2008).

This leads to the assumption that the more users are involved in a co-creation project, the more valuable will be the contributions made by a company's customers. Likewise, when more users participate in a co-creation project, more of them will buy the products; in other words, demand will increase for co-created products.

Co-creation tools play a central role in increasing user involvement. For example, users that chose to use a decision-support system to customise products perceives a higher sense of enjoyment, which in turn has a strong impact on their intended behaviour (Kamis et al., 2008). Additionally, scholars found that an appropriate electronic store-website allows customers to enjoy their shopping experience more, which then increased their willingness to return for future purchases (Kamis et al., 2008).

While researchers acknowledge that positive experiences lead to higher benefits for companies, and that IT tools can help increase co-creation experiences for users, it is not yet clear what form the tools should take in order to deliver the most successful types of co-creation. One of the explanations adopted by researchers is that users who participate in co-creation activities are more willing to buy a co-created product because it better fulfils their needs (Fuchs et al., 2010; Füller et al., 2011). However many companies integrate customers only in the latter stages of NPD, at which point users cannot change the product itself. For example, customers may be asked to share company advertisements using social media tools like "Facebook" in order to obtain some reward or a particular product. From the developers' point of view, such activities do not influence a product's characteristics and should not serve as the basis for accepting a particular product.

To fill this gap in existing knowledge, one part of the thesis analyses a successful co-creation case to determine how online collaborative platform can leverage the customer co-creation outcomes. And moreover, it offers possible explanations for why co-creation affects users' behaviour after the creation process has been completed.

## 2.5 Supplier value-creating

One more key proposition of service-dominant logic is to understand and incorporate marketplace feedback into organizational practices in order to learn to improve the firm's offering to customers and improve firms' performance. The firms can have long-term sustainability only if they can learn in conjunction with other coordinated channel and network partners (Vargo and Lusch, 2004). In other words, collaborating with and learning from customers is being adaptive to their individual and dynamic needs.

In a service-dominant logic, primary type of flow between customer and supplier is information (Vargo and Lusch, 2004). Information can flow within a company and between a company and its suppliers, its distributors, and its existing or potential customers (Evans and Wurster, 1997). It is through the differential use of knowledge applied in tandem with the knowledge of other members of the service chain, that the firm is able to make value propositions to the consumer and gain competitive advantage. All the organizational units including product development management, supply chain management, and customer relationship

management processes are needed to be customer-centric and market driven (Vargo and Lusch, 2004). There need to be an alignment between those organizational functions which fulfills and delivers the promise to customers (Payne et al., 2008). A key issue is how to ensure the diverse elements of customer knowledge that has existed, captured and utilized effectively in order to improve knowledge management and realize its impact on co-creation. This involves: a review of co-creation opportunities; planning, testing and prototyping value co-creation opportunities with customers; implementing customer solutions and managing customer encounters; and developing metrics to assess whether the enterprise is making appropriate value propositions (Payne et al., 2008).

Currently, a great deal of knowledge is created outside of the firm, whether it be at a university or another company or in a hobbyist's garage. The increased rate of NPD, rapidly evolving technologies, shorter product lifecycles and externally available knowledge have all changed the speed of innovation, and at the same time increased its complexity (Plessis, 2007). Companies are not able to cope with the challenges internally; thus, they need to adopt internal and external knowledge flow systems (Chesbrough et al., 2006).

Social media allows users to gather in virtual spaces and generate various content, which can be widely used in the processes of a particular company (Piller et al., 2012). It may involve identifying grievances and errors, finding new ways to use products or adopting user-developed products. However, despite the significant advantages that customer knowledge sharing gives to companies, it also brings additional challenges. One of the most pressing challenges for academics and practitioners has to do with how an organization implements external information flow (Gassmann, 2006; Mortara & Minshall, 2011). With respect to implementing social media, nothing crucial has been proposed so far. Currently, there is little understanding of the best ways in which companies should organize and manage social media, especially how the broader changes may affect an organization's structures and processes (Aral et al., 2013).

This thesis addresses the aforementioned gap by proposing how the adoption of social media changes the structure of companies. In particular, it focuses on the types of changes that occur with respect to R&D activities undertaken by related teams and the processes that they employ (Bergman et al., 2009).

## 2.6 SUMMARY

To summarise, this study investigates the role of ICT in co-creation process. The study is divided into four important elements: the role of ICT in general in co-creation, its relation to users, its relation to companies, and their encounter. These four elements are empirically examined in the thesis using the methodological approaches presented in the next chapter.

# 3. RESEARCH METHODOLOGY

This chapter presents the methodological aspects of the thesis. The section begins by introducing common research approaches and the criteria used to choose each approach. Furthermore, it describes the theoretical contributions of each article, the chosen methods and the procedures adopted for collecting empirical evidence. Finally, it describes the techniques used for data analysis. A summary of the methodologies used for each article can be found in Table 1.

**Table 1. Methodological aspects of each article**

| Article | Theoretical aim | Collection of evidence (N) | Theoretical lenses | Analysis |
|---|---|---|---|---|
| 1 | Analysing | Systematic literature review (41) | Literature review | Mixed content analysis |
| 2 | Explaining | Interviews (10) | Interpretivism | Inductive approach |
| 3 | Explaining | Interviews (3) | Interpretivism | Deductive approach |
| 4 | Explaining and predicting | Meta-analysis (22) | Positivism | MASEM |

## 3.1 Research Approach

Research can be done using three types of research epistemologies: positivist, interpretive or critical (Klein & Myers, 1999). According to Klein and Myers (1999), positivist studies generally attempt to test theory in order to increase the predictive understanding of phenomena. Critical research assumes that social reality is historically constituted, that it is produced and reproduced by people, and its main task is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Interpretive methods of research in the field of information systems (IS) are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham, 1993). While positivist research aims through strict procedures to generalise results, interpretive research does not predefine dependent and independent variables; rather, it focuses on the full complexity of human sense making as the situation emerges (Myers, 1997). The primary endeavour is to describe, interpret, analyse and understand the social world from the participants' perspective (Myers & Avison, 2002).

Researchers that adopt a positivist, interpretivist or critical stance strongly argue about there being only one correct way to view reality. However, according to Weber (2004), differences among the stances "lie more in the choice of research methods rather than any substantive differences at a meta-theoretical level". This view is based on the argument that life has both subjective and objective characteristics and that each of the stances contain a piece of both. This view is supported by other researchers (Landry & Banville, 1992; Robey, 1996). The thesis adopts Weber's (2004) view and chooses the research paradigms according to the particular methodology needed for the research.

Methodologies can be chosen based on the following criteria: (1) the research problem, (2) the researcher's epistemological lenses, and (3) the degree of uncertainty surrounding the problem (Trauth, 2001). This thesis adopts the fact that epistemological lenses should appear as an outcome of the methodological choice rather than as the reason guiding the choice of approach for addressing the research problem. Thus, the methodologies selected will be based on the research problems in question and the degree of uncertainty with respect to the research topic. Moreover, the research problem is treated as the main factor for choosing a particular approach (Gray, 2014; Trauth, 2001).

The tools used in value co-creation activities cannot be studied separately from the environment. ICT recognises a distinction when preparing an environment suitable for various aspects of co-creation, including enabling communication between customers and producers, which is the focus of Paper 1. Moreover, whether or not the co-creation process is successful is almost always predetermined by the producers' abilities and willingness to co-create. Thus, understanding the practices within an organization for coping with co-creation activities and the virtual environment where they occur was the aim of Paper 2. The virtual environment should be designed to successfully integrate customers and build a bridge between them and the offerings of particular companies or suppliers. Co-creation environment design principles and their outcomes were at the core of Paper 3. Most companies expect to leverage and implement customers' ideas during the product development process. Therefore, the aim of Paper 4 was to design a tool to increase users creativity and leverage their ability in expressing ideas

Due to various stakeholders and the different processes involved in co-creation activities, different methods were used in each of the studies. Methodological choice and the adopted epistemological lenses were defined by the research problem and the particular aims of the studies. Therefore, this thesis adopts both positivist and interpretivist lenses and it incorporates both qualitative and quantitative research approaches to answer the different research questions.

## 3.2 Theoretical contribution

Gregor (2006) defined five types of studies according to their theoretical contributions: studies that (1) analyse, (2) explain, (3) predict and (4) both explain and predict and studies that propose (5) designs and actions. *Analysis* theories describe and classify the specific dimensions or characteristics of individuals, groups, situations or events by summarising commonalities discovered during discrete observations. Moreover, they summarise salient attributes of particular phenomena and the relationships between phenomena. Such theories are needed when nothing or very little is known about the phenomenon in question. Theories for *explaining* primarily aim to clarify how

and why some phenomenon occurs and to show how the world may be viewed in a certain way. Explanations are given for how and why things occurred in particular real-world situations. Thus, many case studies fall under this category. Such theories are closely related to theories in the interpretivist paradigm (Klein & Myers, 1999). Theories that aim to *predict* say what will be but not why, treating the proposed system as a black box. Such theories consider the high predictive power of the study in question. Prediction theories refer to the positivist view. Theories that both *explain and predict* suggest causes and make predictions and also describe the theoretical constructs and relationships between them. Such theories say what will be and why it should happen, and they aim to achieve a high predictive power and explain causality. While there is no clear and direct connection between any theory type and any one paradigm, proponents of specific paradigms favour some types of theory more than others, e.g. theories that explain are preferred by interpretivists, while theories that analyse are favoured by realists and theories that predict are favoured by positivists (Gregor, 2006).

The aim of the first paper included in the thesis was to analyse, and categorise discrete value co-creation with respect to IS observations – thus, it falls under the first category of theory. The second and third papers aimed to explain how co-creation affects stakeholders and therefore it falls into the second category. The second paper investigated a sufficient number of cases where different experts presented their points of view and it described how value co-creation processes affect the business side of the equation. The third paper explicitly investigated a single case to show how an online collaborative environment used for co-creation activities affected users' perceptions. The purpose of the final paper was to open a black box on the relationship between IS and individual creativity. The aim was to explain and predict, which puts the paper squarely in the fourth category, as causal relationships were explained and also tested using empirical evidence.

### 3.3 Methods and collections of empirical evidences

The third paper's research question elaborated on the ways in which social media can affect co-creation outcomes, and more importantly, it summarised the 'how' and 'why' of the process. Thus, an inductive research approach was used. In order to 'dig deeper' into the phenomenon, a single in-depth case study was chosen. The case study has been a widely used research form in the IS field (Walsham, 1995). This approach makes it possible to understand the problem as well as the nature

and complexity of the process taking place, and it also allows researchers to obtain valuable insights into a new emerging topic (Rowlands, 2005; Yin, 2003). For example, it makes it possible to assess social media's impact on co-creation outcomes. This case study chosen for the article was Hesburger's "Yummy of the Year" project on social media. This project can be considered state of the art and it could serve as a leading example for other practitioners. Therefore, it was studied in detail. Developers clearly stated that the aim of the project was to monetise social media by using crowdsourcing; thus, the case was quite well suited to answering the research question and generating insights as an outcome. The advertising company "Mainostoimisto Satumaa" developed Hesburger's "Yummy of the Year" design competition. In this study, all company personnel who directly participated in developing the project were interviewed. The team that developed and produced the "Yummy of the Year" campaign consisted of three people, and in-depth, semi structured interviews were conducted with each of them. Lastly, an R&D manager was interviewed for capturing the company's reflections on this campaign. The first interview took 1.5 hours, while the three others took approximately 50 minutes. The differences in time occurred because, during the first interview, the researcher and interviewee went through the whole Hesburger project setting and timeline to better understand the case. Additionally, prior to the interviews other documents were viewed for more insights, such as the company's officially released video reflecting the outcomes of the project, the company's "Facebook" page and newspaper articles. The documents were discussed during the interviews to generate more insights.

   Similarly to the third paper, in the second paper an inductive approach was used, as the study also addressed a research question related more to "how" rather than to "what". However, since the existing literature at the time did not describe the processes by which organizations adjust to new forms of collaboration with their customers, interpretative qualitative research was chosen as the research approach (Klein & Myers, 1999). A semi-structured questionnaire was prepared, with the questions being related to social media usage and to changes in product development within companies. In order to obtain more insights, various social media experts, product development experts and several different company presenters were interviewed. Social media experts were chosen to capture the

main patterns occurring in the market. Product development specialists capture product development specific to the activities of various companies. The interviewees were from separate service-providing companies. All of the participants were from, or were working with, firms that are among the market leaders in India in a particular area and that use social media as part of their activities. Overall, ten people were interviewed. Six of them were from five different social media consultancy organizations, while two of them were from different insurance companies and another two of them were product design specialists. One of the design specialists was working as a freelancer for different kitchenware projects, while another one was only working in one organization.

The choice of methodologies used in the first and fourth papers was guided by the amount of research that had thus far been done to solve the problem. While the research phenomenon was little explored in the previously described papers, in these two papers the research phenomenon was studied in relation to a handful of separate observations. Thus, different types of literature reviews were chosen to answer the research question. In the first paper, a systematic literature review was chosen because systematic literature reviews have been widely used as a means of evaluating what we know about a specific area (Hauge et al., 2010). Moreover, this method provides a framework to appropriately identify gaps in the current research and position new research activities (Kitchenham, 2004), which were the aims of the study. Data collection consisted of relevant scientific articles. In order to satisfy the search criteria, the articles needed to be published in high-quality journals and be related to co-creation and IS. Thus, a search was conducted using the keyword "co-creation" from a list of the 45 leading IS journals, as ranked by Rainer & Miller (2005). The search process identified 41 relevant articles.

In the fourth paper, a meta-analysis method for collecting empirical evidence was used. Meta-analysis is a statistical procedure used to examine the cumulative findings across a number of studies. This procedure makes it possible to draw general conclusions from a body of research and to help reconcile inconsistent findings (Lipsey & Wilson, 2001; Rains, 2005). Meta-analysis is useful when a sufficient amount of research has been done in one particular area and it can be used for central tendency research, pre-post contrasts, group contrasts and associations between variables (Lipsey & Wilson, 2001). Meta-analysis was used in this paper to test developed hypotheses, or in other words, associations between variables. Therefore, creativity and IS relationship studies were located. The search process was conducted in two phases. First, articles with the keyword

"creativity" were located in the "Aisel" database. Additionally, ICIS, ECIS, and AMCIS conferences proceedings within the scholar.google.com database were searched. Moreover, peer-reviewed articles from references lists that were found in few extensive literature reviews, namely Muller and Ulrich (2013), Dean et al. (2006), and DeRosa et al. (2007) were examined.

However, not all relationships among the variables were identified; thus, during the second phase, search was conducted to collect studies that were investigating '*flow* and *cognitive load*' relationship in the context not necessarily related to creativity. To search for *cognitive load* and *flow,* studies found from aisel.aisnet.org and scholar.google.com databases were used. Overall, 24 studies were identified that satisfied the search criteria.

### 3.4 Epistemological lenses

With research question being studied in relation to the various theoretical lenses, the four papers can be separated into three different categories. The first paper adopted a literature review approach. This paper employed methods from both positivism, e.g. statistical analysis in the exploratory stage, and interpretivism, e.g. understanding the psychological and social structures that may impede or facilitate learning and change (Mingers, 2004). The paper used some descriptive statistics and explanations for existing relationships based on past research. It explains the co-creation process and IS by explicitly identifying the means by which structural entities and contextual conditions interact to generate a given set of events.

The second paper and the third paper provided insights into how co-creation changes stakeholders' behaviour and their perceptions. More specifically, it identified how co-creation platforms change companies' processes and how co-creation platforms can be used for marketing purposes. The question focused more on how than on what, which required exploring the field instead of proving an argument and making generalisations based on it. In the second paper, tackling research question with an interpretive approach introduced the views of experts the field and their perceptions of how and why differences appear. By adopting interpretivism as a tradition, the authors of the third paper assumed that

33

the outcomes of the project would be related to the expectations and intentions with which the project was developed. Thus, understanding the viewpoints and expectations of experts and developers and studying their perspectives on how social media contributes to the expected outcomes requires a more open-minded approach rather than merely conducting measurements with standard instruments. Therefore, the epistemological lenses used in the second and the third papers are in the realm of interpretive and qualitative research.

In contrast to two of the previous papers, the fourth paper did not just explain but also predicted the phenomena. The study essentially aimed to answer the question of how IS supports creativity. The research area is mature at this point and plenty of insights have been generated, though the proposed solution still require more of a quantitative approach (Schlichter & Kraemmergaard, 2010), which means that the positivism paradigm should be employed.

## 3.5 Analysis

One out of the four articles (3) used a general inductive coding approach for data analysis. Another article (2) used deductive qualitative analysis (DQA). A third article used both types of qualitative data analysis (1). These methods were selected in order to separate the empirical evidence into different categories and draw meaningful conclusions. One article (4) used a type of statistical analysis called MASEM, which was used to test and confirm relationships between independent and dependent variables and the mediators for these relationships.

### 3.5.1   General inductive coding

General inductive coding is a systematic procedure for analysing qualitative data in which the analysis is likely to be guided by specific evaluation objectives (Thomas, 2006). General inductive coding has been widely used for qualitative data analysis (Bryman & Burgess, 1994). The purpose of using this approach is to condense raw textual data into a brief summary format; to establish clear links between the evaluation or research objectives and the summary findings derived from the raw data; and to develop a framework for the underlying structure of experiences or processes that are evident in the raw data (Thomas, 2006).

For analysing the results, the coding process proposed by Thomas (2006) was adopted. Since two of the articles focused on insights and proposition, a four-stage

process was adopted: (1) initial reading of the text data, (2) identifying specific text segments related to the objectives, (3) labelling the segments and (4) reducing overlap and redundancy between the categories.

The third article used a general inductive method to analyse the interviews. The aim of the analysis was to identify the main categories that, according to the providers, were related to successful social media campaign results. The analysis process was iterative, where the majority of codes were created by analysing the first interview. When new codes were found, the codes were re-categorized. After gathering together all of the codes, the analysis process was repeated for all interviews.

The first article used a general inductive coding to identify different categories. The categories emerged from the raw data, and they were added, withdrawn and combined during the process. They were used to classify scientific articles as well as the various findings presented in them.

### 3.5.2   Deductive qualitative analysis

Deductive qualitative analysis (DQA) is used to condense raw textual data (Gilgun, 2014). The differences lie in how the theory is used. While in general inductive coding, codes and themes emerge from the data itself, in DQA this process is guided by theory. Theory is used to form categories. The data are then classified based on the categories. DQA makes it possible to identify emerging new categories during the process to enrich existing theories.

In article 2, the analysis started with theory-driven categories. Data excerpts were then assigned to the categories. The categories were not modified; instead, they were used as areas for structuring explanations. The explanations were in turn used to draw conclusions. In some parts of article 1, the categories were also established based on theory. However, more categories emerged in the second article, thus enriching the theory.

### 3.5.3   Masem

Meta-analytic structural equation modelling (MASEM) refers to the technique of synthesising correlation (or covariance) matrices and fitting structural equation

models into the pooled correlation (or covariance) matrix (Cheung & Chan, 2005). MASEM was chosen to test the presence of different mediators in the relationship between creativity and IS. Therefore, it made it possible to open the black box and explain why IS affects an individual's creativity.

MASEM was conducted in two phases (Cheung & Chan, 2005; Viswesvaran & Ones, 1995). First, correlation coefficients for the relationships between variables were obtained from different studies, and thus formed a correlation matrix. This process is called HOMA (Hedges & Olkin, 1985). HOMA involves using statistical procedures to calculate the meta-analytic mean correlation between two variables and the corresponding confidence interval (Lipsey & Wilson, 2001). All correlation coefficients was transformed to Fisher's $Z_r$. The transformation was used to normalise all transformations because meta-analytic methods assume that the sampling distribution is normal (Hedges & Olkin, 1985). Due to the different sample size, some correlation coefficients were more precise than others. Therefore, coefficients were weighted according to their standard errors to equal their impact (Hedges & Olkin, 1985), i.e. a larger sample size with a correlation coefficient would be more important in determining the validity of the hypotheses.

In the second phase, the correlation matrix was analysed using maximum likelihood structural equation modelling (Cheung & Chan, 2005). To ensure trustworthiness and the validity of the analysis, various tests were performed.. A homogeneity test was done in order to choose a fixed-effect or random-effect model for further analysis. The model's significance was tested by calculating the Chi-square and its p-value as well as by using RMSEA, CFI, AIC, and LBCI measures.

### 3.6 Summary

To answer the research questions established at the beginning of this project, qualitative as well as quantitative methods were used. A systematic literature review, qualitative expert research and a qualitative case study, as well as meta-analysis approaches, were used.

# 4. RESULTS

This chapter discussed the main results presented in four articles. One of the articles explains ICT's role in co-creation at the general level, while another article explains ICT's role in supporting users at the front end of product development, a third article explains ICT's role at the back end of product development and a fourth article focuses on changes within companies after they adopt co-creation through ICT.

## 4.1 Article 1

Article 1 focuses on co-creation studies in the IS field, categorising the tools used for co-creation and explaining the process along with the stressed benefits for each of the stakeholders.

The study develops classification system for the platforms, or ICTs, used in co-creation. The classification system is based on new product development stages. Six platforms were classified: (1) virtual forums, (2) crowdsourcing platforms, (3) toolkits, (4) virtual worlds, (5) broadcasting tools and (6) wikis. The findings show that different platforms are used for different purposes, and they can have different benefits for the co-creation stakeholders.

At the beginning of the co-creation process, ICT works as a starter, increasing users' skills and providing an environment for generating solutions. It results in various benefits as perceived by users, ranging from altruism to socialization. Satisfied users are more likely to generate value co-creation outcomes for organization, such as outcomes with sales or marketing-related benefits. The organization at the end needs to respond to users' contributions by developing

products that users desire, thereby motivating or encouraging them to continue and facilitating the co-creation process and ensuring its continuance. For details, please see Figure 2.
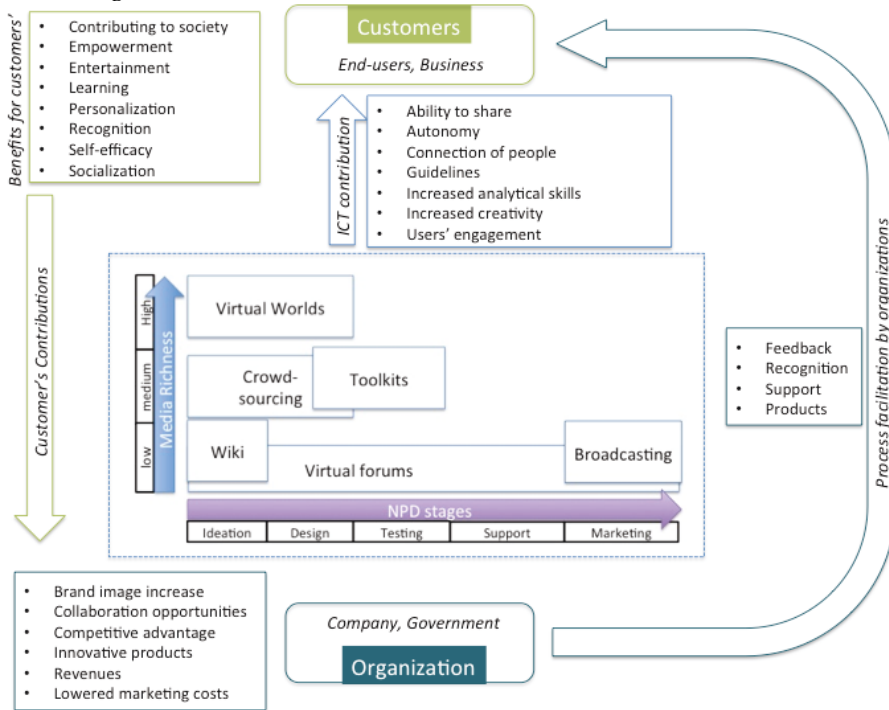


**Figure 2 ICT's role in the cycle of co-creation**

The article contributes to the existing literature by conceptualising the co-creation process and ICT's role in it as well as by identifying future gaps in the research field. Nambisan and Nambisan (2008) classified the platforms used in co-creation, and this article adopts their classification model, extends it and enriches it by explaining the benefits each of the platforms can offer to different stakeholders. Moreover, it describes ICT's role in co-creation and the relationships among stakeholders. Such knowledge contributes to a better understanding of co-creation and the platforms used during the process. The proposed framework could be a source for designing successful interactions between users and companies.

## 4.2 Article 2

Based on the collected interviews and deductive analysis, this article explains why social media became an important part of product development and how the adoption of social media affects the structure of an organization. Moreover, the study discusses issues that prevent companies from further integrating social media in their processes.

Social media replaced traditional ways of doing market research for a couple of important reasons. Social media makes it possible for a process to appear faster. The ease and adoptability of ICT makes it possible to share content much faster, and at the same time, to reach a higher sample. Moreover, these social media features directly influence R&D activities, as the need for new products comes from the market. Thus, more content is created by users, more of users' needs are met, and they can be identified at greater speed. Companies increasingly recognise the potential of the crowd making contact with user communities more frequently and ask for their input at each stage of product development.

On the other hand, some issues prevent companies from integrating social media in their processes. Intellectual property leakage can occur, and thus a company can lose its competitive advantage. The development of products that derive their value from human senses, e.g. materials that they touch, are not yet suitable for full online creation. Companies also have limited resources, which they need to allocate wisely in order not to threaten important processes. And for some products, especially in developing countries, the target group is not online yet or is not willing to participate or even capable of participating in all NPD stages.

Besides the aforementioned issues, social media can add a great deal of value to companies, and companies are adjusting their structure to obtain more benefits from it. Integrating users into NPD through social media affects organizational structure via three types of coordination: (1) departmentalization, (2) centralization and (3) cross-department relations (Table 2). Three possible types of changes can be found based on this coordination model. Companies can try to *centralize* their social media-related departments. They may opt to create a single central media team, which then coordinates other teams. The team is created

using social media experts from other departments. This type of construction ensures *cross-department relations*, and knowledge related to social media flows between them. There were also some *departmentalization* changes noticed. Some innovative strategies separate the R&D department into two departments. One of them is dedicated to collecting ideas, flaws and customers' grievances, thus working on ideation, whereas another department applies its knowledge to develop a real product from proposed ideas, concepts or errors in past offerings.

**Table 2 Categories and quotes**

| Type | Centralization | Departmentalization | Cross-department relations |
|---|---|---|---|
| Quotes | "it is controlled by one team, like corporate marketing or corporate communication" | "it fits under NPD as part of the very beginning stage for collecting insights." | "There has to be a free flow of information between each department" |

To summarize, we observed three types of social media being integrated into R&D practices. The first type relates to incremental changes, where no major adjustments were made. Social media was merely added as one more channel to collect grievances from users. The second type of changes relate to adding one department that coordinated other departments related to social media and that consisted of people from each of the coordinating department. The last type of changes had to do with separating the product development team into two units, with one being responsible for collecting ideas and the other actually developing the product.

### 4.3 Article 3

Based on the collected interviews and inductive analysis, this study reveals the benefits that can be achieved by companies engaging their customers in value co-creation activities. Moreover, the article emphasises the importance of platforms and proposes supported activities that can assist in developing a successful co-creation approach. As theoretical contribution, this paper presents a modified Payne et al. (2008) framework.

The case study shows that company didn't learn much from users, and received only a small number of innovative ideas, thus neglecting product development

outcomes. However, the company was extremely satisfied with the marketing outcomes, such as reaching more customers and increased sales that derived from the design competitions. In this sense the company did not benefit so much from a minority of participants, but rather the majority, who were converted to customers.

Tools for online crowdsourcing and customer co-creation in general can be successfully utilized for both product development and marketing purposes. One of the most important benefits of co-creation for companies is revenue. Revenue makes it possible to sustain a business and keep introducing new offerings. Another advantage for companies is the preferences of customers. By reaching a larger crowd and making it easier for users to express themselves, companies can accumulate better knowledge about users' needs and tailor their products accordingly, thus increasing user satisfaction with the offerings. By engaging users in co-creation, companies as well can receive advertising-related benefits. One such benefit is the introduction of a company's offerings, which becomes easier as users learn about different parts of the products while co-creating, and thus the negative effect of commercials can be more easily dismissed. Users that have decided to engage in a company's activities leave their contact information, and in such a way different companies can locate and reach real fans. Moreover, companies acquire information that relates to user segmentation. By launching product development contests on social media, companies can obtain general information about each user. This makes it possible for them to build a knowledge base about their customers' characteristics.

The paper complemented the framework designed by Payne et al., (2008) with the value propositions by Tuunanen et al. (2010, p. 48) to enable a deeper analysis and discussion on the role of a system in facilitating co-creation. Emphasis is put on the design of encounter processes where customers and a supplier meet. The system is constructed to address customer value drivers based on three encounter processes, namely (1) social interaction, (2) identity construction and (3) constructing game-like experience. Identity construction reflects on system abilities to help customers to create or alter their identities in real or virtual lives. Social interaction describes system capabilities to integrate a user in their preferred social environment, e.g., using the system in a group or in isolation. A

game-like experience depicts the characteristics of the system to draw and sustain user attention. The framework is presented in Figure 3.
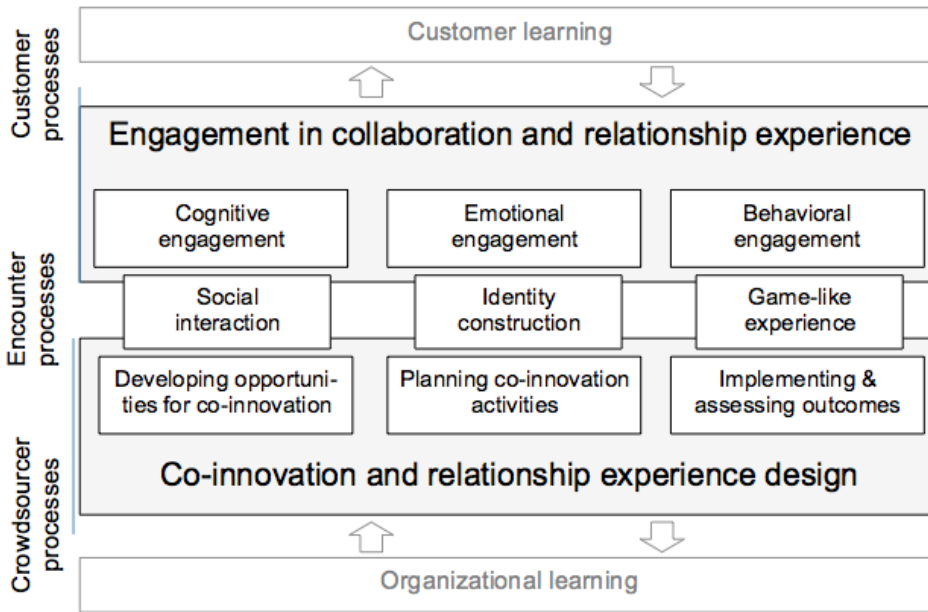


**Figure 3 Proposed framework for customer co-creation on digital platforms**

These findings help us to understand the benefits of more extensive active interaction with consumers, and to facilitate consumer-product understanding. In comparison with past forms of advertising, such as commercials, co-creation can better provoke consumer curiosity, concentration and enjoyment with respect to a product's features.

### 4.4 Article 4

This article explains why IS affects creativity. We did this by building hypotheses based on the theory of flow and cognitive load theory and testing them with MASEM. The model consisted of two hypotheses, each of which was related to one

of the aforementioned theories. The results demonstrated that (1) challenging tasks affect creativity through a mediator - flow experience (Figure 4), and that (2) ease of use affects creativity through cognitive load (Figure 5).

The degree of *challenges* in a particular creativity task required user input, which can be manipulated by the IS provider. It can be adjusted for users according to their background and experience. Users are challenged to the point that they have to use their skills while at the same time not being too bored. Thus, striking the right balance between a user's skills and the challenges of the task as well as stimulating an interest in the tasks will arouse so-called *flow experience*. Flow refers to a state of complete immersion and concentration on the task. It refers to the type of optimal experience where users become so immersed in the task that time seems to fly. High levels of concentration on and enjoyment of the activity leads to more *creative* solutions generated by users.
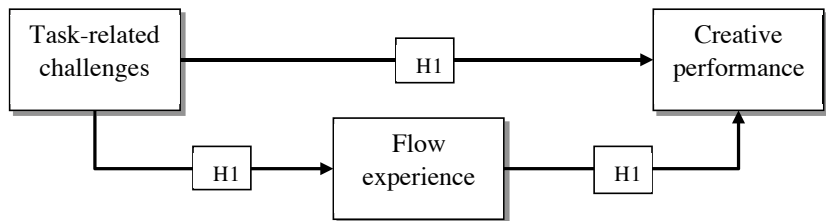


**Figure 4 Hypothesis 1**

Another variable that can be controlled via an IS provider is how *easy to use* the system is. While *easy to use* systems in general lowers creativity, since users can perceive it to be not challenging enough or with too little possibilities, it can be a valuable resource in managing the amount of information processed by users. If IS designed to provide information, the important factor lies in how much information users can process. Information in creative tasks can be provided in the form of examples of previous solutions to similar problems, more detailed explanations of particular problems or insights or solutions generated by other users to solve the same problem. *Easy to use* systems lower the *cognitive load* perceived by users, and thus they free up more brainpower for information

processing and for connecting of new elements with already known ones. Therefore, higher ability to process and store information leads to higher *creative performance.*
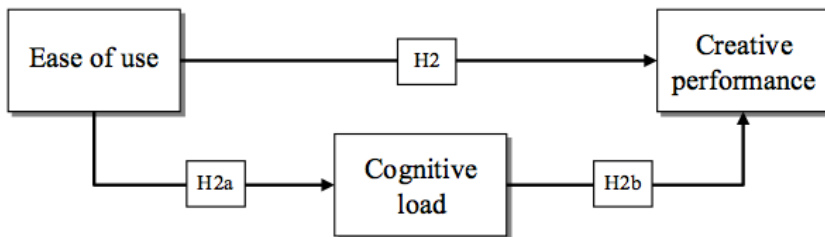
Figure 5 Hypothesis 2

The notion that technology can boost an individual's creativity has been known for a long time. However, the existing literature does not explain so well how this process actually happens. Scholarly research indicates that IS can affect people's creativity by (1) engaging them in the process, and (2) equipping them with useful information (Greene, 2002). The research findings presented in article 4 enriches the literature by first adopting Greene's (2002) proposed viewpoint and then further explaining, with the theory of flow and cognitive load theory, how and why IS can affect an individual's creativity. For practitioners, this research provides a suitable model for designing IS, one that will help individuals to generate creative solutions. The research suggests that systems should be concentrated on equipping users with information that can be used to generate solutions and they should be easy to use. Additionally, the process should be challenging. However, the challenges should come either from the task or from the process, such as competition with peers, placed goals or interesting and novel tasks, rather than from usage of the system.

To summarise, this article opens the black box and explains the relationship between creativity and IS. In general, the proposed model shows that the theory of flow and cognitive load theory are suitable for describing why technology influences user creativity.

# 5. DISCUSSION AND CONCLUSIONS

Interest in how customers can be better integrated into NPD has recently been growing in IS research and the findings of this study contribute to this discussion. The thesis improves our understanding of how IS used, designed and implemented in the value co-creation process to achieve various benefits. This section describes the findings and their theoretical and managerial implications as well as areas for further research.

## 5.1 Discussion of the main findings

This study takes previously discovered relationships between factors as a starting point and develops the knowledge explaining the basis on which such relationships exist and how it could be facilitated. In more detail, this study is based on four acknowledged propositions, which are related to each of the four articles and at the end build a comprehensive picture based on the separate parts. The propositions are as follows: (1) two-way communication should be established between customers and companies to facilitate co-creation (Prahalad & Ramaswamy, 2004), (2) companies need to adjust their structure before they can adopt an open innovation approach (Gassmann, 2006; Mortara & Minshall, 2011), (3) users participating in product co-creation develop a relationship with the product (Franke et al., 2009; Fuchs et al., 2010), and (4) creativity can be influenced by IS (Seidel et al., 2010). To explore the aforementioned propositions, we formulated three research questions: (1) "What is ICT and what is its role in value co-creation?" (2) "How does the use of value co-creation and ICT change a company's internal R&D processes?" (3) "How can ICT affect users' outcome

developments during different NPD phases?" At the end, these questions will be formulated as one central question that connects all the parts and describes the general contributions to the field: "*How does ICT affect the value co-creation process?*"

To answer the first research question, we conducted a thorough literature review of the IS field to locate articles discussing co-creation with respect to ICT. Drawing on the findings of prior studies, we proposed a framework for ICT in value co-creation and its role in the co-creation cycle. We performed inductive as well as deductive analysis to develop a framework.

We answered the second question by abbreviating social media and the practices of product development experts with respect to changes within companies after they started to co-create with their customers. Based on collected data, the study proposes several common ways that companies can adjust the structure of the R&D department and its interactions via social media.

The third question dealt with the user side of the co-creation process. It consisted of two parts: how to increase the creative abilities of users and how to engage them with the product they co-created. The way in which co-creation boosts individual creativity was examined based on previous studies. We tabulated their results as a means of testing the hypothesis posed in our study. We also used a qualitative approach to analyse a single case and consider developers' aims and perceptions and the product outcomes from a different angle.

## 5.2 Theoretical and managerial contributions

This thesis enriches co-creation literature with respect to the use of ICT in these activities in three main ways. First, it describes ICT's role within the broad picture of co-creation. Second, the study proposes guidelines for ICT design that can achieve successful co-creation outcomes and explains why such outcomes should occur. Finally, the thesis suggests organizational practices that affect R&D-related department changes after the adoption of co-creation.

### 5.2.1 Theoretical contributions

This thesis makes several important theoretical contributions. In the first place, it participates in the discussion of how IS used within value co-creation activities. The literature shows that a wisely designed environment can help users be more

creative and change their perceptions of companies and the products they co-create. However, we need to understand that open innovation in general, and co-creation in particular, requires structural transformation: "opening up the production to a network of collaborators makes it necessary to build new capacities and systems of reward and communication" (Lindman, 2011). While researchers have concentrated on the motivations of users for participating in co-creation (Füller, 2010), this thesis presents a broader picture: it aggregates different parts of the process, whether from the perspective of users, the company or ICT, and assesses the role of each of the parts in facilitating co-creation activities. This study proposes that ICT works as an amplifier that connects co-creation stakeholders and enriches their communication. It does so by suggesting a framework for a successful co-creation tool. Such a tool will be successful through its feature of allowing users to satisfy their needs, which results in co-creation benefits. Additionally, co-creation tools make it possible to receive feedback from a producer in various forms, thus ensuring satisfaction and continuity of the process.

Moreover, this thesis participates in the discussion on the theoretical keystones of co-creation outcomes and the advantages of using ICT in this process. It does so by establishing a framework that combines the advantages for and practices of each of the co-creation participants. The findings presented in this study demonstrate that elements of the framework should be separated by different types of roles. The study suggests a cycle in which each part needs to be established in order to achieve long-term co-creation. This contribution answers the first research question and it is based on article 1. As a result, we proposed a framework based on a thorough review of the literature on IS and its relation to co-creation.

One additional contribution relates to the value co-creation approach implemented within companies, which the second research question addresses. Integrating customers into NPD not only shapes an organization's offerings and their users, but also the organization itself. The extent to which an organization collaborates with other actors has been shown to affect its internal R&D processes (Schroll & Mild, 2011). This study is one of the first such studies to look at organizational changes in order to exploit collaboration with customers. It

enriches the literature on co-creation and open innovation by revealing the ways in which organizations adjust their internal R&D processes and their interaction with customers through the use of value co-creation tools in order to implement and facilitate co-creation. Companies often choose to add an additional department coordinating the other departments related to social media in order to successfully include social media into product development processes. This central department usually consists of people from each of the other departments. Additionally, companies may separate the product development team into two units, with one unit being responsible for collecting ideas and the other actually developing the product. Moreover, companies tend to interact with customers more and more frequently. Therefore, our findings emphasise the importance of adjusting organizational structure and of interacting extensively with customers.

Furthermore, this study contributes to the existing literature on designing co-creation tools. Co-creation tools can affect user engagement during the co-creation process by lowering the mental requirements for input, and at the same time, maximising the perceived benefits (Randall et al., 2007). Co-creation tools can also increase a user's attachment to a particular solution that he or she may have developed (Franke et al., 2009). This thesis enriches this body of knowledge by proposing a design so that the tools can achieve these outcomes. First, this study proposes that tools can increase users' ability to develop a creative solution by creating challenging environment and thus engaging them in the task, while also freeing up a user's mental resources and allowing him or her to process more information and to connect it with already acquired knowledge. Second, this kind of environment (Nambisan et al., 2008) can create a sense of engagement and feeling of trust towards the co-creating company through the environment that supports social interaction, identity construction (Tuunanen et al., 2010), and game-like experience (Hamari et al., 2014). Thus, this work proposes that co-creation tools can shape users participation in co-creation activities and their perceptions, and also shows how companies can co-create value with a crowd of users beyond mere product development. This contribution is related to research question number 3.

As the technology's influence on an individual's creativity was for a long time treated as a black box (Seidel et al., 2010), these results enrich not only the co-creation literature but also the creativity literature as well.

### 5.2.2 Managerial contributions

An organization needs to make decisions about the aim of co-creation — whether the aim is novel product development or marketing-related efforts, such as finding new customers or sustaining and increasing connections with existing customers. Through successfully designed co-creation activities, both aims can be achieved at the same time. However, different aims emphasise different designs for virtual environment strategies. When aiming at a novel product outcome, the tool designed for users should bring challenges, but at the same time still be easy to use. Challenges can arise, for example, when developing certain tasks with the end result being a competition among peers. Also, management can provide certain goals that user needs to meet and thus guide them through the process, while at the same time still keeping them engaged. Resolving such challenges can be a task by itself if the task is devised in such a way that it arouses a person's curiosity in how to solve the problem. The other issue is that IS should still be user-friendly. This can be done by including little triggers and features in the system. A lack of features can result in less possibilities, thus new features can be introduce during the point at which users are already becoming familiar with the older features. Several development phases can be formed with different aims. For example, during the first phase the core of the concept can be developed, while during the second users can look through other users' work and during this phase the concept can be modified and perfected.

Aiming directly at product development might not be the best strategy when involving a crowd (crowdsourcing approach). If a product development contest brings thousands of participants and the company uses only a few of the developed ideas - dismissing the contest participants later - it might be an inefficient way of using the crowd. It would be more efficient to use crowdsourcing for marketing outcomes, for example by creating increased attention and commitment by the customers to the company, and thus convert the participants into customers. Online platforms facilitating the interactive process, supporting transparency and creating a continuous game could enhance user's learning about products facilitating concentration, stimulation and a feel for solutions. Importantly, merely adding social components to the co-creation activity does not necessarily yield any benefits or profits (Oestreicher-Singer and Zalmanson,

2013). Rather, integrated design toolkits play a crucial role in shaping a user's perceived experience.

For the companies that are willing to engage in long-term co-creation with their customers, this study gives suggestions how to adjust the company's structure. For instance, by dividing the R&D into separate units for different purposes, where one unit is responsible for gathering and evaluating ideas from social media, while another is responsible for implementing them in practice, allowing the firm to gradually integrate social media into NPD. Another strategy could be to create a unit responsible for social media activities, for communicating and coordinating social media knowledge among departments.

## 5.3 Future studies and limitations

This thesis reveals that users will buy products when they have helped develop them, and moreover, they often offer insights that affect the co-creation outcomes. While the thesis suggests that the more customers participate and the greater their willingness to affect the outcome, the more companies will achieve positive outcomes. However, this can also bring negative results as well. Engaged customers might be demanding. They may insist on particular products that they co-created, even though the production of such products might not be beneficial at all for companies. Therefore, future studies could study the trade-offs needed to make both sides happy and ensure successful collaboration.

The main limitation of the study, which also brings possibilities for future research, has to do with the way in which empirical evidences were collected. One article was based on a single case study. Thus, testing the results or applying the research to different settings might yield additional findings. The majority of the articles included in this work are based on qualitative research, thus future work could be done that builds hypotheses and tests them.

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# PART II: ORIGINAL ARTICLES

# ESSAY I

Pacauskas, D. (Unpublished): ICT's Role in Value Co-Creation: Literature Review and Future Research Agenda.

* Currently in review in an international journal.

  Full text is not included in the electronic version of the dissertation

# ESSAY II

Pacauskas, D., Durgam, P., & Fomin, V. V. How Companies Can Modify R&D for Integrating Social Media Activities into the New Products Development. Published in 27th Bled e-Conference (e-Ecosystems), 2014

# How Companies Can Modify R&D to Integrate Social Media Activities into the New Product Development Processes

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## Abstract

*Over the past decade, open innovation achieved enormous amount of attention both, from scholars and practitioners. This research considers one aspect of open innovation i.e. customer innovation through social media, and delves deeper into companies' practices that efficiently integrate information from social media into New Product Development (NPD) processes. This study adopts mechanism of coordination method to explore how moving from traditional product development to open innovation affects changes in R&D. This investigation finds four important factors companies focus on while integrating social media into NPD processes. The factors are, namely, (1) frequent interaction with customers, (2) open information flow, (3) building a unit for coordinating activities, and (4) dividing R&D into units for tackling issues related to ideation, concept development, and actual product building separately.*

**Keywords**: Social media, R&D, New Product Development, co-creation, open innovation

# 1 Introduction

For a long time vertically integrated R&D was the most commonly used model for developing new products. While products and services were developed within the company, customers were treated as passive users. But with the emergence of open innovation (Chesbrough et al., 2006), customers are now being actively included in new product development processes (NPD), and are treated as value co-creators within the company.

In the past decade, open innovation became a hot topic among management scholars. Vrande et al., (2010) presented different areas of open innovation research, which include open innovation in SMEs, open innovation and competition patterns, the role of individuals in open innovation, the relationship between open innovation and entrepreneurship in determining the innovation performance, and how firms can profit from large scale form of open innovation.

One field of open innovation is customer innovation. Even though co-creation in customer innovation has been known for more than 15 years, companies have adopted it on a larger scale only recently. In the traditional NPD process, the product was created within an organization, but now social media platforms, such as Facebook, Twitter, blogs and virtual forums, have paved ways for companies to reach their customers in the online environment, thereby increasing the pace of product development through continuous customers collaboration.

Customer collaboration with an open innovation approach is considered as an antithesis to the traditional vertically integrated model of R&D where products are developed internally (Schroll and Mild, 2011). Thus, with the increased application of open innovation activities, some scholars have also started questioning the role of internal R&D (Schroll and Mild, 2011).

Even though open innovation and co-creation have attracted a lot of attention from scholars, it's not yet clear how R&D is adjusted to employ open innovation in general and customer innovation in particular. The above uncertainty leads us to the research question of this paper:

*How are companies adjusting their internal NPD activities in order to handle collaboration with their customers through social media?*

> *- How is the structure of R&D department affected?*

> *- What are the new processes being integrated within NPD processes?*

To tackle these questions we looked into the theory of 'mechanism of coordination' within organizations to explain structural changes in R&D department processes. This research is based on qualitative data collected through interviews with product developers, managers and social media experts from leading companies (consumer products, retail & insurance) in India.

## 1.    2 Literature Review

The nature of global economic growth has been changing due to the speed of innovation, rapidly evolving technology, shorter product lifecycles and a higher rate of new product development. The complexity of innovation has increased the amount of knowledge readily available to organizations (Plessis, 2007). Despite the role of knowledge as a key component for continuous innovation, the practice of dedicated knowledge management to support innovation has not yet become fully accepted in firms (Chapman and Magnusson, 2006). This is due to the difficulty of integrating knowledge management into the process of innovation

(Xu et al., 2010). Open innovation requires even more sophisticated approach to knowledge management, as knowledge can be acquired from different sources including customers, governmental agencies, third parties, and even competitors.

Some studies have already examined the implementation of open innovation within organizations from different perspectives. Herzog & Leker (2010) looked into the organizational culture and documented that there are different innovation cultures required for closed and open innovation. Kuschel (2008) investigated the ecosystem of products within companies and found the significance of information infrastructure in contextualizing the ecosystem and thereby supporting open innovation. Wincent et al., (2009) researched how the network governing boards should be organized in order to improve the innovative position of network participants. Bergman et al., (2009) introduced group decision support systems complementary to the development process, which also acts as supplementary tools for knowledge creation in open innovation.

Despite these past studies, there remains a gap with respect to the implementation of open innovation activities within companies. Chesbrough & Appleyard (2007) argue that the biggest challenge for firms is overcoming the limitations of traditional business strategies. They need to integrate strategic approaches that address both the inside-out and the outside-in processes of open innovation (Giannopoulou et al., 2010). Hence, open innovation requires a different mindset and a wide set of new capabilities within companies (Vrande et al., 2010). More empirical research is needed concerning strategy, organizational culture, organizational structure and human factors that support open innovation (Vrande et al., 2010).

To answer the research question this study focuses on one aspect of open innovation, i.e. customer innovation, taking place within a social media environment. This study also examines the organizational changes occurring within the R&D department after the integration of social media into its innovation processes.

## 2.    2.1 Social media

A social media environment can be described as a highly interactive platform where individuals & communities share, co-create, discuss, and modify user-generated content (Piller et al., 2012). Social media includes social networks like Facebook and Twitter, blogs,  and virtual forums amongst others. Companies active in social media platforms track discussions, comments, feedbacks, beliefs and innovative ideas related to new & existing products & services.

Approaches to harvest product-related knowledge form social media platforms can be much more sophisticated than the simple process of gathering customers' feedback. For example, customers can be given design tools and asked to implement their ideas using those tools. For such collaboration to be successful users have to be motivated, data gathered from the users needs to be managed and social media platforms have to be tracked for customer activity. All of these activities require integration of collaboration practices within R&D processes and methods. So if managers decide to adopt a certain "open" strategy they need to modify the current organizational structures & processes and at the same time develop the relevant capabilities that will help in executing this strategy (Giannopoulou et al., 2010).

## 3.    2.2 Mechanisms of Coordination

Companies typically have separate functions, teams and individual roles specifically designated for the 'inside-out' process (Mortara & Minshall, 2011) to gather innovative ideas and coordinate the process. Martinez & Jarillo (1989)

found the mechanisms of coordination used by multinational organizations varying from the most 'formal and structural' to the most 'informal and subtler' ones.

In order to understand structural changes in an R&D department that uses customer knowledge acquired from social media, this research views the R&D department through the *mechanism of coordination* lens.

A mechanism of coordination can be described as an administrative method used to integrate different units within an organization (Martinez & Jarillo, 1989). There is a pressing need to incorporate Mechanisms of coordination in organizations as they have different administrative & functional units, which require concerted coordination effort in order to be effectively operational (Martinez & Jarillo, 1989).

There are 8 mechanisms of coordination divided into two groups – structural or formal, and informal. They are namely (1) departmentalization, (2) centralization, (3) formalization, (4) planning, and (5) output control belonging to the first group, while (6) cross-departmental relations, (7) informal communication, and (8) socialization belonging to the second group (Martinez & Jarillo, 1989).

# 3 Methodology

This research finds qualitative research appropriate for open innovation and follows past open innovation researchers who have adopted a case study approach (Vrande et al., 2010).

For the purpose of this research, a qualitative exploratory study was conducted. A semi-structured questionnaire was prepared with questions relating to social media usage and changes in product development in the chosen companies in India. Major companies in different consumer products and insurance segments – market leaders in India using social media actively for product development - were contacted in search of suitable interviewees. In order to draw more insights people in different roles (with varied responsibilities) were shortlisted. The profiles ranged from social media experts (who tracked important ongoing trends), to product development experts (who documented product development specific activities), and even included other experts involved in social media activities in marketing, sales & services (who followed service development related activities in social media platforms). All the interviewees were either employees of the firms or were working as third parties for the firms..

Overall ten people were interviewed. Six of them were from five different social media consultancies working for various organizations – while two were associated with different insurance companies, two were third party product design specialists, one was a freelancer for different kitchenware projects, and another worked for a home appliance firm. Refer table 1.

| Position | Organization | Type of business |
|---|---|---|
| Senior social media consultant | "Social world"* | Social media consultancy |
| Social media consultant | "Social world"* | Social media consultancy |
| Social Media manager | "Media for all"* | Social media consultancy |
| Social Media technical and functional consultant | "Breakthrough"* | Social media consultancy, and tool development |

| Social media expert | "Other side"* | Social media consultancy |
|---|---|---|
| Social Media Expert | "We know the answers"* | Social media consultancy |
| Product designer | Freelancer | Kitchenware products |
| Product designer | "Groundbreaking house"* | Home appliances |
| Regional area manager | "Safe"* | Non-life Insurance |
| Insurance product manager | "Security for you"* | Health and Life insurance |

**Table 1:** Interviewees
*Organization names are changed*

The interviewees explained their viewpoints with the help of several examples. For instance, the social media experts made key observations about companies that have been successful in using social media in NDP process. Both the product design specialists and the insurance product manager talked about how they integrated social media processes within their respective organizations. A regional area manager with an insurance company stated that they had plans to implement activities with customers through social media in the next quarter. They hoped to start implementing changes to efficiently handle the process of co-creation. None of the participants were willing to reveal the identity of their firms and hence to maintain confidentiality, this research has changed the names of all companies. But the authors are aware of the company details.

Interviews were on an average around half an hour in length. All interviews were recorded, transcribed, and coded. Interviews were analyzed bearing in mind the mechanisms of coordination, which were taken into account to understand the changes in R&D structure & processes related to NPD. Data Analysis was conducted in two main steps. First, coding was performed to identify coordination mechanisms for the companies that adopted social media. Based on data analysis, three co-ordination mechanisms were found – (1) departmentalization, (2) centralization, and (3) cross-departmental relations (see table 2 for examples). The next step involved analyzing interviews based on the derived mechanisms. While data categorized under *departmentalization* category was analyzed based on structural changes, data attributed to *centralization* mechanism was analyzed taking into account the department's layout involved in social media activities, and data labeled as *cross-department relations* was evaluated on the basis of the information flow within departments.

| Type | Departmentalization | Centralization | Cross-department relations |
|---|---|---|---|
| **Quotes** | "it fits under NPD as part of at very beginning stage for collecting insights." | "it is controlled by one team, like a corporate marketing or corporate communication" | "There has to be free flow of information between each department" |

**Table 2:** Initial coding categories and examples

# 4 Results

In this section, this research examines the role of social media in the company's NPD in general and re-structuring of R&D. The study starts by explaining why social media is an important part in product development. It also examines how social media is being used in the context of NPD, the changes it brings about in

R&D practices and organizational structures, and finally dissects the reasons that prevent firms from integrating social media into their NPD and R&D processes.

## 4.    4.1 Reasons for social media starting to play an important role

This research has observed the increasing popularity of customer collaboration through social media. There has always been a huge scope for social media integration. As traditional market research methods were not able to capture target market insights, customers' presence online forced companies to deploy communication tools for continuous online collaboration.

> "10 years ago I hardly used to share 10 things in a week, as the only thing I could do was to go to a telephone booth and call someone, but now as I have a device and plenty of different applications that facilitate communication, I am able to share maybe 22 updates per day.  Traditional marketing research was done using a very small data sample. How can 1.1 billion people be represented by lets say 7000 people? Now Facebook can give me a data sample of 91 million people in India. You can listen to that in real time and you can get 20000 feedbacks everyday" – mentioned by a "Breakthrough" consultant responsible for social media activities

The idea for new products needs to come first. In many cases the idea, whether it is radical or incremental innovation, is derived from the unsatisfied market in the form of complaints, suggestions or new concepts.

> "The need for the new product comes from some kind of market feedback. It's not that we sit in office and think up something." – "Safe" manager (Regional Area Manager actively involved in Social Media)

Online communities created by social media users providing feedback and suggestions motivate companies' to participate in social media activities. Communication with the customers on social media platforms doesn't end after the first stage i.e. getting the idea. Companies interact whenever they have the possibility to interact with their customers for feedback.

> "You take different sketches and you upload to different design websites. There are user design specific websites like "behance", and a design forum called "design in India" specific to India. "Design community in India" is a very closely related community; you can get insights and can get feedbacks form that site and is the first intervention in social media, during the concept generation. After the concept is generated then again you are going for online interaction. When marketing and sales approves the concept, then we build the CAD and build something we just call the product renders. When these renders are done, they are circulated through internal regional managers. These regional managers later circulate feedbacks to us. There is also a survey done on colors (e.g. festive colors or the color of the month). Our products are distributed all over the India, so we developed India specific colors." – freelance product designer for kitchenware products taking responsibility for activities happening on the online platform

When time-to-market becomes crucial for technology products, the design concept moves directly to the sales department and at this stage the interaction with the customers is not terminated. In fact customers are used as testers and based on their feedback, companies improve products as fully functioning solutions.

> "We follow AGILE model of product development. We quickly build something and putting online. And we keep on doing alpha testing, beta testing, everything while it is still online. We start selling and we keep making it better. And that is

*how most of the technology products are today built. Marketing pace is so fast, you can never make it good enough to go.*" – "Breakthrough" consultant who performs as social media technical and functional consultant.

## 4.2 Changes in NPD related activities

### Centralization

For dealing with activities related to social media either a new organizational unit is created or an already established unit becomes responsible for such activities.

> "*Mostly it's lead by one team. In some cases there is a corporate marketing team, which collects information and passes to the branding team and customer service teams. In some cases, there is social media team and some companies are also coming up with chief social media officer. But the best model what we have seen is, that there is one central social media team, which has its team members working for the different departments, loosely connected to all these departments. It can be that some departments do not have a representative for social media, but those departments are connected to the social media team. Social media team act as a moderator.*" – "Breakthrough" consultant

Maturity of the brand plays an important role in deciding the structure of the social media team, (the team being formed either internally or formed with external social media experts). Bigger companies have more rigid structure, where departments have clear and strict responsibilities. The type of social interaction depends on the size of the company and the way in which knowledge is accumulated over the years.

> "*Which departments will interact with social media agency depends on maturity of the brand. If it were not a mature brand then there would be an entire chain of departments involved. A slightly more mature brand - the marketing team will be talking to this social media agency. With an even more matured brand – PR team and the marketing team take the responsibility. The most mature brand will create their own agency, develop tools and will have an interaction with all of the departments.*" – "Media for all" manager

### Cross-department relations

The more rigidly the organization is structured, the more time is needed to take a decision and initiate some actions. However, in a competitive environment with fast product development cycles, time is a crucial resource.

> "*If it is a very flexible organization then almost every department will be involved to some extent in the social media activities. In case it is very structured organization with the closed attitude, then there is a rigid information flow from one department to another, which involves a lot of time. On the other hand if the departments are closely related, customer information, customer support interaction are used, analyzed, conclusions are drawn and passed to other departments. There has to be a free flow of information between each department and maintain that there is no redundancy. The more departments that are connected to social media, stronger is the online space , and there will be free flow of information among all of them*" – "Other side" expert

Social media experts form a ''social team'' and each member is assigned a particular department ensuring that the online knowledge flows from the social media team to their respective departments on continuous basis.

> "*Each department has a social media champion who is a part of this team managing a social media project. So this is the guy who takes initiatives and*

*talks about them in the team. This guy is involved in social media activities, but works within other department too."* – "Media for all" manager

An instance where the entire firm becomes more open, has a user centric approach and has a willingness to share information.

*"Senior management also brings lot of insights into the product, for example international flavors. My CEO travels a lot and has family based all over the world. What happens is that e.g. when a new mixer is launched, the CEO sends a link to look up motivating that these kinds of things need to be developed. This entire interaction happens on a Facebook page. I along with the marketing guys can view those Facebook posts."* – freelance product designer

### Departmentalization

The ideas for the product design and features come from the market and not from the R&D department. Later these ideas are converted into concept and developed as products. Due to this reason, firms are trying to departments into separate units in such a way that there is a unit that researches the market, a unit that develops the product idea and a unit that develops the real product based on the generated idea.

*"Part of the ideation happens first. Till recently we had the technical departments, which used to design the product and now we have separated R&D department. For example, one department designs the product and later refers to the respective technical department. The technical department later develops the actual product based on their technical knowledge and legacy knowledge, ultimately saving a lot of time. Then you can start your publicity by telling the market about this new product and start selling it."* – "Safe" manager

Another unit responsible for tracking customer satisfaction and the co-creation procedure is playing an important part in product development.

*"There should be one more very important tool for identifying the grievances. There are clients who satisfied with your explanation, but there are grievances that might not get solved. For example, we have a policy conditions that states the limitations for compensation available for a particular case –e.g. disease. A customer will understand the limitation of his compensation while signing the policy, but then he might not be happy with it. He may have a grievance still, he may publish it through the social media and probably generate a discussion on this issue. The complaint is not over, the file is not closed at that point of time."* – "Safe" manager

## 4.3 Issues preventing from usage of social media more frequently

There are concerns, which doesn't allow firms to fully rely on social media while developing the product. One concern is the intellectual property issue.

*"Intellectual property is getting leaked therefore conceptions are circulated cautiously and not on a regular basis. But at the same time we can generate the ideas and concepts in a different way. For example, we can make an idea; get a feedback about kitchen equipment, without its body embedded completely inside the kitchen platform."* – freelance product designer

Some types of products need to be observed in reality to receive proper feedback on material, texture, etc. In this case social media is of no use.

*"We go to the shop and demonstrate our product to get a feedback. If a consumer likes the product, he wants to touch it, feel it, operate it and see how it works."* – freelance product designer

Another issue is that the target users are not yet online and observing only consumers that are in social media might not give right insights.

> "*Our target consumer for kitchen appliances are mostly housewives and they are not very 'online proactive'.*" – freelance product designer

Customers themselves are not willing or motivated to interact in all phases of NPD.

> "*When the product reaches somewhere in the middle of product development phase, in a very crucial kind of a period, you cannot interact with the consumers. But interaction with consumers in all phases would give us an advantage in making less mistakes, in improving the products and making new products that is exactly designed for the consumer*" – freelance product designer

Limited resources that company have needs to be allocated wisely.

> "*Before you launch a product you are no one. You are absolutely no one, no one is talking about you and no one is giving you a feedback or giving you anything. But you can keep a close track of competition before even entering that space. However, you need to take a decision whether you want to spend a lot of time looking at the competition before you launch or just concentrate on building the product based on the limited resources we have. But once the product is in the market, you can't take away your eye from the competition at all.*" – "Breakthrough" consultant

## 5 Discussions and Conclusion

Open innovation and especially co-creation is an important topic both for scholars and for practitioners. More and more companies are trying to implement online co-creation strategies into their processes. However, still no evident practices have emerged on how to efficiently utilize the open innovation in NPD. Therefore this research has explored various company practices coping with social media integration into NPD. This study focuses on structural changes in companies' R&D structure. This research aims at providing insights rather than generalizing.

After analyzing the interviews, results are categorized into three possible structural changes that affect departments related to NPD after the integration of social media.

Firstly, social media does not cause structural changes. Companies treating social media as an additional communication tool reach out to the customers to collect their grievances. Based on Willcocks et al. (2013) findings related to the initial phases of technology adoption, (where new technology is used to replace old one) the processes around the technology to capitalize its potential are not changing.

Secondly, changes are related to the addition of one more departments that is responsible for social media activities, coordination and for distributing of information to separate departments (please see figure 1). Even though collaboration among departments is encouraged, there is still a clear division of responsibilities between different units. However having a social media unit strengthens the cross-departmental relationship. Departments have a representative for managing social media activities and the same representative co-ordinates with other departments satisfying the centralization mechanism. Such integration help establish information flow within the company, eventually creating higher interest towards social media related activities.
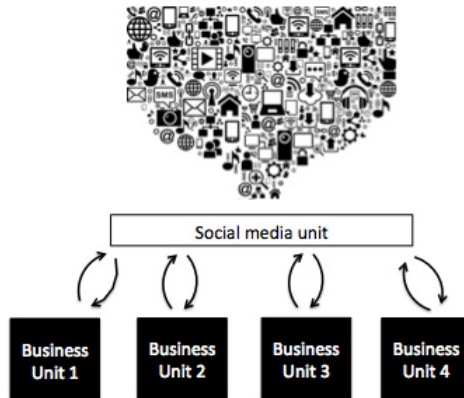
**Figure 1:** establishment of social media coordinating unit

Third type relates to a completely new product/service development, where the structure is modified to bring ideas from the users (please see figure 2). This study finds that companies in order to better use resources divide their R&D into multiple units. Different units are used for managing different activities, for e.g. gathering market needs, forming concept and implementing the concept to develop real product. Moreover, this research observes that once firms leave behind the traditional product development model and adopt social media, they tend to engage with their customers more frequently. Some of the observed companies even try to get customers feedback during every stage of product development.
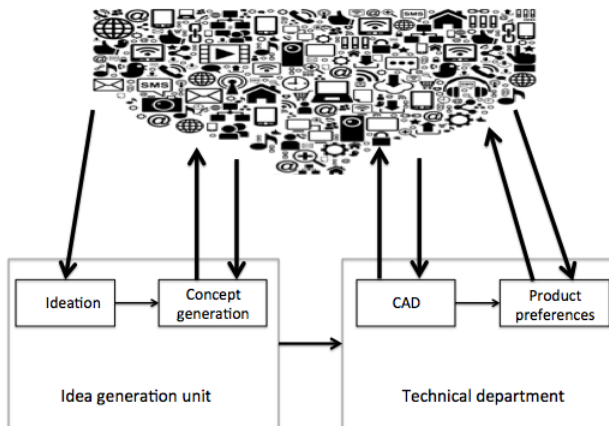


**Figure 2:** separation of product development and intense interaction

Additionally, this research highlights some barriers towards tighter integration of social media in NPD. Schroll & Mild (2011) reveal that open innovation complements the existing vertical R&D processes. This study showcases that the culture of the customer involvement through social media defines the R&D practices of the firm - specifically, to those firms who decide to stay away from social media. Moreover, Huizingh (2011) notices that success of open innovation depends on internal and external environment. Internal context relate to company's demographics and strategies. Demographics are mainly studied with regard to the company size: large versus small. This research enriches this discussion with the findings, which reveal that success of innovation can be affected by maturity of the

brand and the structure of social media management unit. Lesser the maturity of the brand, lesser is the departments' interaction with social media unit. The flexibility of the organization also plays a crucial role. The more flexible organization is, the more departments are involved in a communication with the social media unit.

Finally, this research observes a new user behavior pattern. In traditional product development there are five phases varying from ideation to go-to-market (Nambisan, 2002). This study finds that users are willing to participate in the firsts and the last stages, however they are not motivated to contribute in to the middle stages of product development.

As a practical contribution, this study showcases some insights, which can be useful for companies willing to adjust their internal processes to integrate social media more efficiently. This study argues that dividing the R&D into separate units for different purposes, where one unit is responsible for gathering and evaluating ideas from social media, while another is responsible for implementing them in practice, allows the firm to gradually integrate social media into NPD. Moreover, developing a unit responsible for social media activities, for communicating and coordinating social media knowledge among departments is a factor crucial for NPD.

This paper has some limitations, which could be addressed for future research. Firstly, all companies in which interviews were conducted are based in India and studies on innovation and social media related practices in different countries might produce different insights. Secondly, this research addresses only limited amount of products and services, thus future research could look into different products and services as well as different industries. Finally, this research points to the practices regarding how firms are dealing with social media leading to successful NPD and not towards any measurements, thus future research could be based on developing and testing hypothesis.

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# ESSAY III

Pacauskas, D., Rajala, R., Westerlund, M., Mäntymäki (Unpublished): Leveraging User Innovation with an Online Communication Platform: Case Study of a Crowdsourced Hamburger.

# ESSAY IV

Pacauskas, D., Rajala, R: Information System Users' Creativity (Forthcoming): A meta-analysis of the link between IT use and creative performance.

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Customer co-creation has been in the forefront since the past year and has moved from few success stories to massive customers integration into new product & service development process. Although customers' opinions and insights can be incorporated with the classical- pen & paper- approach, computer technologies have elevated this process to a different level. Through this research, we show how digital environment can support and provide customer integration in new product & service development process. This research highlights on how ICT can be designed & structured to nurture & enhance customer creativity, on how ICT can persuade customers to accept the co-created products and, what actions companies can take to implement customer knowledge gathered through the technology

BUSINESS + ECONOMY

ART + DESIGN + ARCHITECTURE

SCIENCE + TECHNOLOGY

CROSSOVER

DOCTORAL DISSERTATIONS