TAMPERE UNIVERSITY OF TECHNOLOGY

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NOVEL APPROACHES TO VALUE CREATION IN NETWORKS – CASE STUDIES ON CROWDSOURCING, SWARM-WORK AND GAMIFICATION

Master of Science Thesis

Prof. Hannu Kärkkäinen has been appointed as the examiner at the Council Meeting of the Faculty of Business and Built Environment on August 14, 2013.

ABSTRACT

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For years, value creation has been a hot topic in both academic and business literature. Perceptions of value and value creation have changed over time in parallel with economic changes and technological developments. In the early 21st century, we are approaching towards digital service economy where businesses and organizations are increasingly seeking new ways to benefit from business opportunities mostly enabled by the Internet and Web 2.0 technologies. However, due to the novelty and vast number of different concepts not much is known about value creation through social media and recently emerged ICT-based approaches.

The purpose of this study was to increase general understanding on social media and ICT-related value creation by exploring different novel value creation approaches in intercompany networks. The study was conducted as a qualitative business research with theoretical and empirical parts. The theoretical part consisted of an extensive literature review focusing on the two key aspects of the study: value creation and novel social media and ICT-based value creation approaches. The empirical part consisted of a multiple case study with three different cases: Konecranes GrabCAD Challenge, xTune and Kaleva Innopinion Campaign. The data was collected with a netnography including participant observations and focused interviews. The participant observations were conducted in case-related online environments and we interviewed four different persons from the case organizations.

As a result, this research identified the current trends in value creation and described how they differ from more traditional views by exploring different characteristics that epitomize novelty. The study also introduced several frameworks and models for analyzing and visualizing value creation in networked environments. In addition, the research identified several recently emerged novel value creation approaches that essentially build on social media and other ICT-based approaches, and focused more intensively on crowdsourcing, swarm-work and gamification through the case studies. In conclusion, the case studies revealed that social media and modern ICT are in essential role in enabling value creation and several characteristics of novelty in the cases.

TIIVISTELMÄ

TAMPEREEN TEKNILLINEN YLIOPISTO
Tietojohtamisen koulutusohjelma

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Jo vuosia arvonluonti on ollut tärkeä aihe ja paljon näkyvillä akateemisissa ja ammatillisissa julkaisuissa. Käsitykset arvosta ja arvonluonnista ovat muuttuneet aikojen kuluessa taloudellisen ja teknologisen kehityksen rinnalla. Nyt 2000-luvulla olemme astumassa kohti digitaalista palvelutaloutta, jossa yritykset ja organisaatiot keskittyvät yhä enemmän Internet ja Web 2.0 -teknologioihin perustuvien liiketoimintamahdollisuuksien hyödyntämiseen. Kuitenkin arvonluonnin näkökulmasta erilaisten käsitteiden ja toimintatapojen hyödyntämisestä tiedetään vielä varsin vähän.

Tämän tutkimuksen tavoite oli ymmärtää sosiaalisen median ja modernin tietotekniikan mahdollistamaa arvonluontia paremmin tutkimalla erilaisia arvonluontimalleja yritysten välisissä verkostoissa. Tutkimus toteutettiin sekä teoriaan että empiriaan pohjautuvana laadullisena liiketoimintatutkimuksena. Teoreettinen osio koostui laajasta kirjallisuuskatsauksesta arvonluontiin ja uudenlaisiin sosiaaliseen mediaan ja moderniin tietotekniikkaan perustuviin arvonluontimalleihin liittyen. Tutkimuksen empiirinen osio muodostui kolmesta tapaustutkimuksesta: Konecranes GrabCAD-haaste, xTune ja Kaleva Innopinion-kampanja. Empiirisen osion aineiston keräämisessä käytettiin netnografiaa, joka koostui tapauksiin liittyvien online-ympäristöjen havainnoinnista ja neljän asiantuntijan teemahaastatteluista. Haastateltavat henkilöt olivat kukin tapaustutkimuksen organisaatioista.

Tutkimuksessa tunnistettiin nykyisiä trendejä ja uutuutta edustavia ominaispiirteitä arvonluontiin liittyen ja kuvattiin kuinka ne eroavat perinteisemmistä näkökulmista. Tutkimuksessa esiteltiin myös useita arvoverkostojen analysointiin ja visualisointiin tarkoitettuja viitekehyksiä ja malleja. Lisäksi tutkimuksessa tunnistettiin useita uusia sosiaaliseen mediaan ja moderniin tietotekniikkaan perustuvia arvonluontimalleja yleisellä tasolla ja keskityttiin tarkemmin joukkoistamiseen, parvityöhön ja pelillistämiseen tapaustutkimusten muodossa. Tutkituissa tapauksissa sosiaalinen media ja moderni tietotekniikka olivat tärkeässä osassa mahdollistamassa arvonluontia ja uutuutta edustavia ominaispiirteitä.

PREFACE

By far the Master's Thesis project has been the most challenging and rewarding process in my life. It has given me great experiences which, I believe, will prove valuable in the future. The subject of the thesis – value creation through novel social media and ICT-based approaches – is in many ways complex but truly interesting and topical. This study strives to extend understanding over the subject, and I sincerely hope the results will generate a good academic debate in the future.

This research was conducted as a part of SOILA-research project in Novi Research Center at Tampere University of Technology. I would like to thank my supervisor professor Hannu Kärkkäinen and project manager Jari Jussila for their valuable comments and guidance throughout the writing process. I learned a lot from you and enjoyed working with you. I hope this thesis meets your expectations and will provide good foundations for future research. I also want to express my gratitude to TEKES – the Finnish Funding Agency for Technology and Innovation – for funding the research, and SOILA-research project for providing such an interesting subject for my thesis. In addition, I want to thank all the case organizations for participating in the research. I hope this study gave you a lot of new insights and understanding regarding the subject. I am also thankful for Tampere University of Technology and the Department of Information Management and Logistics for providing an inspiring working environment for the duration of my studies and career as a researcher.

I want to show my gratitude to all my friends and family who supported me during my studies. I cherish all the happy moments we have spent together. Also, I would like to address special thanks to my fellow researcher and good friend, Aki Alanne, whom with I shared many fruitful discussions regarding the thesis, and who took his personal time to read and comment my work. Finally, with all my heart, I want to thank my beloved girlfriend, Satu, for her constant support and encouragements. Without her believing in me, I would not have managed this far.

In Tampere, 19.12.2013

Jani Multasuo

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ABBREVIATIONS AND NOTATION

B2B	Business-to-Business
B2C	Business-to-Consumer
BPMS	Business Process Management System
EIM	Electronic Intermediary
ERP	Enterprise Resource Planning
G-D	Goods-Dominant (Logic)
HR	Human Resource
ICT	Information and communications technology
IPR	Intellectual Property Rights
IS	Information system
IT	Information Technology
NPD	New Product Development
RBV	Resource-Based View of the Firm
RSS	Really Simple Syndication
SBN	Smart Business Network
SBNi	Smart Business Network Initiative
S-D	Service-Dominant (Logic)
TCE	Transaction-Cost Economics
UGC	User Generated Content

1. INTRODUCTION

"*The creation of value is the core purpose and central process of economic exchange*" (Vargo et al. 2008, p.145) is a sentence a few can disagree with. No matter if your business focuses on selling groceries, everyday house holding equipment or mobile phones for customers; sells heavy machinery and tools for industrial companies; or offers a wide variety of services and consulting services for other businesses, the purposes for doing it always wind around the concept of value. For customers this means their subjectively perceived value – "*the overall assessment of the utility of product*" (or service) "*based on perceptions of what is received and what is given*" (Zeithaml 1988, p.14). For companies it essentially relates to making profits and capturing value through delivering particular products and services at a given cost and offered price (Porter 1996, p.62).

These two aspects have been acknowledged and linked to economic development a long time ago (see e.g. Smith 1776; Dixon 1990; Vargo et al. 2008). However, the actual value creation activities have changed drastically over time as development of new technologies and management approaches open up new opportunities for businesses (Porter 1996, p.62). Economic transformation led to re-thinking of traditional value creation theories. Underlining this transformation a paradigm shift from goods-dominant to service-dominant logic is recognized (see e.g. Vargo et al. 2008) where processing information and transfer of new knowledge are essential activities (Teece 1998, p.58). In addition, tremendous developments in ICT and Internet revolutionized the way how to do business (Timmers 1999, pp.3–4; Janneck et al. 2008, p.501), and allowed the development of new ways to create and deliver value (Amit & Zott 2001). Nowadays businesses pursue to benefit and create new value through novel business opportunities mostly enabled by Internet technologies (Zott et al. 2011a, pp.7–11).

These newly emerged business models also emphasize value creation and value capture, as well as a system perspective on 'how to do business' (Shafer et al. 2005; Zott et al. 2011a, p.20; Zott et al. 2011b, p.2). The digital economy allows enterprises to explore and experiment new forms of value creation mechanisms where value is co-created by a firm and a plethora of partners in a network for multiple purposes (Zott et al. 2011a, p.11). During this digital era Web 2.0 and social media essentially changed how businesses perceive customers and users by introducing terms such as mass-collaboration, social applications, and collective intelligence (see e.g. Tapscott & Williams 2006). Thus, customer is no longer a passive buyer or consumer but a key part of the enhanced business network where they co-create and extract business value. This

all suggests that value is seen and understood as ‘value-in-social-context’ (Edvardsson et al. 2011, pp.336–337) rather than through previously mentioned dualistic view.

1.1. Research background

We live in a complicated and dynamic world where business environments are mixed realities of virtual and physical presence of multiple actors (Janneck et al. 2008, p.502); where Web 2.0 and social applications became quickly an essential part of individual user’s everyday life, and a key element of conducting business (Murugesan 2007, pp.34–35). Creating value under these circumstances is one point but understanding how value is created and captured is truly another. As the title of this thesis already suggest, we are now going to dive into this complicated world to explore how novel value creation models can be utilized to deliver value in networked environments.

Value creation has gained a lot of attention in academic and business research literature. This is understandable since the concept lies in focal point of any business. The topic has been studied, for example, through the perspectives of strategic management literature (see e.g. Williamson 1981; Barney 1991; Porter 1996; Amit & Zott 2001), strategic network literature (see e.g. Stabell & Fjeldstad 1998; Gulati et al. 2000; Allee 2002), business model literature (see e.g. Shafer et al. 2005; Zott et al. 2011a), innovation literature (see e.g. Allee & Taug 2006; Jacobides et al. 2006; Chesbrough 2007; Chesbrough & Appleyard 2007), and marketing literature (see e.g. Prahalad & Ramaswamy 2000; Prahalad & Ramaswamy 2004; Smith & Colgate 2007). Much of this discussion revolves around division between *value capture* and *value creation* (Priem 2007); value capture refers to the firm’s ability to appropriate and retain payments made by consumers in expectation of future value for consumption, whereas value creation involves innovation that establishes or increases consumer’s valuation of the benefits of the consumption (ibid, p. 2006). Holding on to one perspective may lead to rather unbalanced review, as it is often the case especially in strategic management literature with value capture often in focal point (Johannessen & Olsen 2010, p.503). The novel approaches in value creation, however, require analysis in both value creation and value capture, as well as a system perspective on ‘how to do business’ (Shafer et al. 2005; Zott et al. 2011a, p.20; Zott et al. 2011b, p.2).

Another key concept regarding this thesis is novel social media and ICT-based value creation approaches, withholding a myriad number of different applications and concepts (e.g. social media, crowdsourcing, collective intelligence, smart business networks, big data, business intelligence etc.) each generating thousands of hits through popular research search engines. Somewhat generalizing the topic these concepts are often placed behind the term ‘Enterprise 2.0’, which often refers to a use of social software within and between companies and other actors in business networks (see e.g. Mcafee 2006; Bughin 2008). The other part of these novel concepts is the emerging

technologies. According to Gartner's latest hype cycle (August 2013) technologies such as predictive analytics, location intelligence, gesture control, enterprise 3D printing, and virtual reality will reach their 'plateau of productivity' in the next five years. However, technologies like augmented reality, wearable user interfaces, gamification, big data, and prescriptive analytics are believed to reach the same state in 5 to 10 years. (Schofield 2013.) Entering the plateau of productivity means mainstream adoption; it is achieved when the real-world benefits of the technology are demonstrated and accepted. (Linden & Fenn 2003, p.9). This does not imply that these technologies cannot be used before reaching the plateau: In fact many pioneering companies are actively researching the technologies and seeking new ways to benefit from them (see more about interpreting hype cycles on Linden & Fenn 2003).

Mixing these two key concepts – value creation and emerging social media and ICT based approaches – offers an interesting but challenging area for research. There are many reasons and issues why research on these topics is important. Firstly, concept of value creation is difficult as a research topic due to its social context-bound nature. Thus empirical studies focusing on the exact moments of value co-creation and value exchange, including collection of data directly from the actors involved in the situation are required, but not very often seen in literature (Edvardsson et al. 2011, p.337). Conducting such case studies may be extremely hard or not even wanted from business perspective due to value creation's focal point in doing business. Value creation is key part of business models, and thus important for gaining competitive advantage over rivals (Shafer et al. 2005).

Secondly, following the hype cycles, demonstration of real-world benefits requires intense research and documentation of empiric case studies. Moreover the concepts in the early phases of hype cycle are still evolving fast, so constant research is needed to reveal the true possibilities they may hold. Much of the literature is still focusing on defining these novel concepts or forming typologies for them, as maturity of the concepts does not yet allow in-depth analysis on benefits or value creation related to them. For example crowdsourcing has gained relatively much attention in recent literature (see e.g. Howe 2008; Vukovic 2009; Brabham 2011) but analysis of crowdsourcing related benefits (see e.g. Afuah & Tucci 2012; Kärkkäinen et al. 2012; Simula & Vuori 2012) and crowdsourcing related value creation (see dialogue Afuah & Tucci 2013; Bloodgood 2013) have had considerably less attention.

Thirdly, state of the art literature describes many of these concepts through scientific and practical publications but a comprehensive and commonly accepted classification scheme to help structuring the subject areas, or subject area related case studies, is missing. This is the case, for example, in the use of social software (i.e. Enterprise 2.0) (Back & Irmler 2012, p.221). One interesting research establishment – Smart Business Research initiative (SBNi) (see e.g. Vervest, Preiss, et al. 2004; Vervest et al. 2008) – is

focused especially on novel concepts and emerging of them in business networks. They offer a fresh perspective on this area, for much of the literature is focused on analyzing newly emerged eBusiness models, such as eBay, and finding ways how to create similar or more effective ways of conducting business. SBNi, however, focuses on how smartness can be merged into business networks by using novel technologies and specific capabilities of different actors in the network (Vervest, Heck, et al. 2004), while not turning the whole business into eBusiness, which is in the focal point of the whole research in this subject area.

Finally, since value creation activities and technologies are social context-bound and increasingly moved to Internet or digital environments, there is an increasing need to develop new research methodologies and techniques designed specifically to study these new research settings. Methodological discussions question the capabilities of more traditional methods to capture the virtual or digital elements of research subjects (see e.g. Kozinets 1998; Kozinets 2007; Williams 2007). New methodological solutions are thus important for capturing especially the value creation situations, as mentioned earlier.

Rising from these circumstances, we recognize a need in combining the above mentioned two research subjects: value creation and recently emerged social media and ICT-based approaches. This need is also recognized by a wider research establishment, namely Novi Research Center in Tampere University of Technology. This research is conducted as part of Novi's SOILA research project[1], and thus the research setting and objectives of the study are in line with SOILA's objectives. Next we go through the research problem and supporting research questions outlining the research in this thesis.

1.1.1. Research problem and research questions

Taking into consideration the wider research establishment (i.e. SOILA-project) and the aforementioned developments in information and communication technologies and Web 2.0 applications, as well as the general need in understanding value creation related to the novel ICT-based approaches (i.e. the research gap), we can formalize a problem statement that guides the research process in this thesis:

How can social media and novel ICT-based approaches be used to create value in recently emerged value creation models in intercompany networks?

The problem statement fundamentally derives from the previously mentioned background of the study, and withholds essential aspects considering also general academic research, and especially research gaps, on this area. However, the problem

[1] See SOILA research project website: http://www.tut.fi/novi/projects/soila-innovative-value-creation-and-business-models-of-social-media-in-b2b-networks/

statement, in the form as it is, is too extensive to cope within a single research. Thus, some supporting research questions that specify the scope of the study, have to be generated. The supporting research questions are illustrated in figure 1.1, which works also as an essential framework for guiding the study.

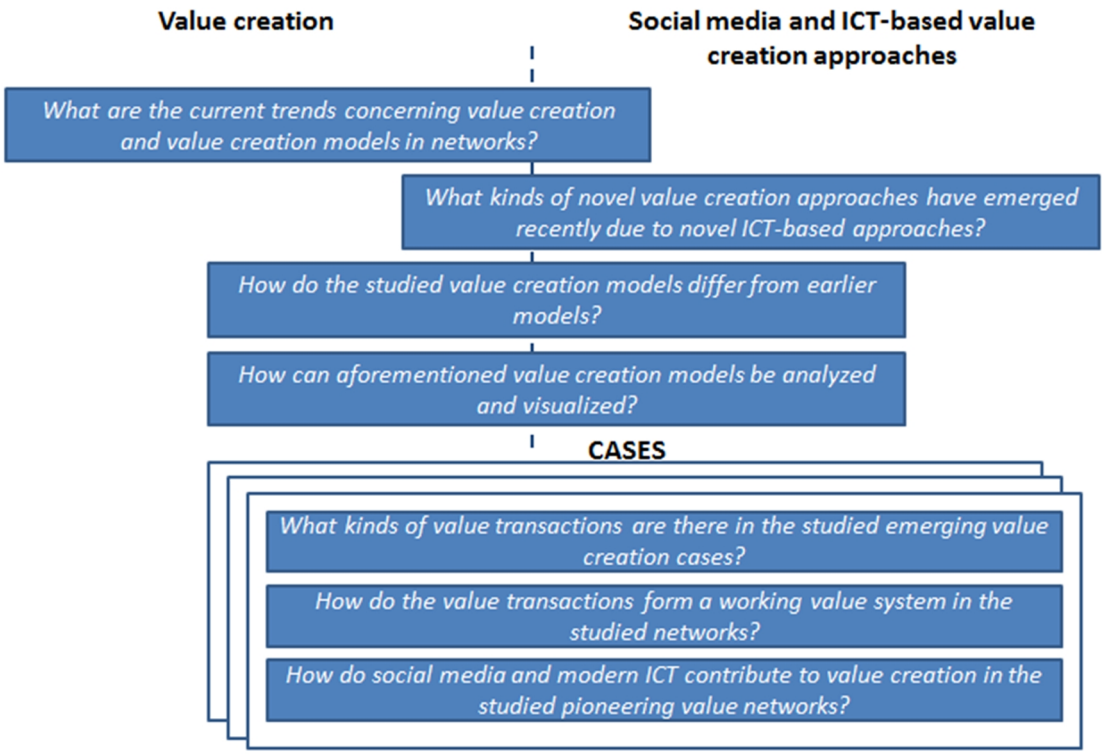

Figure 1.1. *Research questions in relation with the key concepts of the thesis*

Firstly, regarding the whole research subject, we recognize a dualistic division between the key concepts in this study: *value creation and novel social media and ICT –based value creation approaches*. These concepts are separate, but not mutually exclusive, and they form the focal point of this study. In order to find answers for the problem statement, we need to study both concepts thoroughly by examining current trends in value creation, exploring the wide spectrum of novel social media and ICT-based approaches, identifying their key characteristics and comparing them with more traditional ways of creating value. The first four research questions are aimed to fulfill these requirements, and their positioning in figure 1.1 explains their relevance towards the key concepts of the research subject.

Secondly, we acknowledge that the rise of digital economy has offered firms the potential to experiment with new forms of value creation, where technological solutions and Web 2.0 applications play an important role (Zott et al. 2011a). However, we also understand that there are a myriad number of different concepts, applications, approaches, and technological solutions which make these new value creation mechanisms possible. Thus, the second research question is especially needed to bring

clarity on these matters, and fourth research question identifies the mechanisms needed for analyzing these new models.

Finally, in order to answer the *'how'* part of the problem statement, and for keeping the scope of the study manageable for a single thesis, we have to limit our research to a few selected 'cases' that reflect novel ways of creating value by exploiting social media or other ICT-based approaches. We understand that many of these novel approaches have rather unique and context bound mechanisms for creating value, and thus it would require extensive individual analysis of each one of them. In order to keep the contents of the study manageable, we will focus more extensively only on three selected concepts, namely crowdsourcing, swarm-work, and gamification. Crowdsourcing can be defined as an *"act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call"* (see Howe 2006; 2008). Swarm-work is a new way of organizing around tasks and projects on the basis of interests and competencies in business context (Ruohisto 2013, p.17). Gamification is defined as *"the use of game design elements in non-game contexts"* (Deterding et al. 2011, p.9). Each concept is discussed more extensively in chapter 3.

Since this thesis builds around the three selected concepts, it is only natural to view them as cases. The three cases include: Konecranes GrabCAD Challenge, which represents a novel way to create value through crowdsourcing complex engineering tasks in a traditional machinery industry; xTune case describes how swarm-work, with intelligent software can be used to support business operations in general; and Kaleva Innopinion Campaign, discusses how crowdsourcing with gamifying elements together with highly intelligent algorithms are used to create value in media industry. The cases were selected in collaboration with researchers and research partner networks of SOILA-project. In figure 1.1 the research questions associated with the cases are shown inside the three layered rectangle. Thereby, the same questions are relevant for all the three concepts under scrutiny, and they aim in deepening understanding on *how the value is created in the specific cases.*

Exploring the research subject by finding answers to the research questions and synthesizing them, establishes foundations for answering the actual problem statement of the study. Next we will view the objectives of the study.

1.1.2. Objectives of the research

The objectives of this study are delivered through previously introduced problem statement and research questions. At this point, it should be understood that the research balances between academic and business research boundaries. Thus the objectives of the study are more general in nature, and reflect the purpose and objectives of a larger

research establishment (i.e. SOILA-project), even though the studied subject is tightly business bound. This situation emphasizes the neutral position of the researcher since the study does not aim in resolving a specific business or managerial problem; neither does it serve any specific company *per se*, even though it is easy to agree with the potential benefits this study could offer for the selected case organizations.

The purpose of this study is to increase general understanding on value creation and novel value creation models in intercompany networks. The study follows the trends of value creation and explains how the concept has transformed due to recent developments in ICT, and what kinds of novel value creation models are currently possible. Moreover the study focuses on few relatively novel concepts, namely *crowdsourcing, swarm work* and *gamification*, and explores and explains how value is created through these concepts.

Even though the selected concepts represent only a snapshot of the whole wide spectrum of different value creation approaches, we aim to find generalizable results for contributing in general academic research by bridging the research gap and finding relevant subjects for future research on selected research areas. Selected cases are essential for delivering this purpose as they synthetize the theory and practice. Thus, considering the cases, we would like to appoint several important objectives as well. Firstly, the cases aim to offer an example how the selected value creation approaches merge with case organization's value system and generate value. These examples are meant not only for the selected case organizations but also for wider audience of companies from several industries. The purpose here is to challenge and encourage other companies to explore how the results or similar implementations of novel value creation approaches would benefit their areas of business.

Secondly, for the selected case organizations the study aims to offer a rich visualization and in-depth analysis of the current situation in organization's value creation network. Essentially this deepens the case organization's understanding on value creation and brings forth important aspects from the utilized novel value creation approaches which can be used to further develop organization's activities. Suggesting such development plans or advices, however, does not fit the nature of this thesis.

Aforementioned objectives and purposes of this research together with the general problem statement and research questions are essentially affecting the research design. The next chapter discusses the possibilities for different methodological selections and rationalizes the selections considering this study.

1.2. Research design

Fundamentally the basic purpose for conducting research is to increase understanding on specific issues or aspects. Individuals and organizations constantly face different kinds of issues in their everyday lives, and deciding on these issues requires gathering the relevant information and investigating it more deeply. (Ghauri & Grønhaug 2005, p.9.) Thus, essentially embarking on research is about developing new knowledge (Saunders et al. 2009, p.107) and using it to support the decision making process on encountered issues (Zikmund et al. 2012, p.5).

Research is often viewed as a process, where *"a set of activities unfold over time"*(Ghauri & Grønhaug 2005, p.29). A number of textbooks and different authors (see e.g. Ghauri & Grønhaug 2005; Dul & Hak 2008; Saunders et al. 2009) agree on the sequence of these activities: Research processes typically start with defining the research topic and choosing methodological foundations for the research; and continue through collecting and analyzing data; finally ending in reporting the results. However, more debate over the selection of research philosophies, research approaches, research strategies, as well as methods and techniques exists (Olkkonen 1994, pp.59–60). In addition, the previously mentioned concepts are terminologically difficult and often interrelated (see e.g. Ghauri & Grønhaug 2005; Koskinen et al. 2005; Saunders et al. 2009). This all suggests that understanding these interrelated terms and exploring different options regarding each of them, a comprehensive research framework is required and essential for any specific research effort.

Saunders', et al. (2009, p.108) *'Research onion'* (see figure 1.2.) research framework effectively illustrates the relations between research philosophies and approaches, strategies, as well as techniques and procedures. Even though research strategy or methodology is often seen as the fundamental part for describing the research design, some authors (see Guba & Lincoln 1994, p.105) argue that questions of methods are secondary to the choices in research paradigms. Paradigm, defined as the basic belief system or worldview, guides the researcher not only in choosing the methods but in ontologically and epistemologically fundamental ways (ibid.).

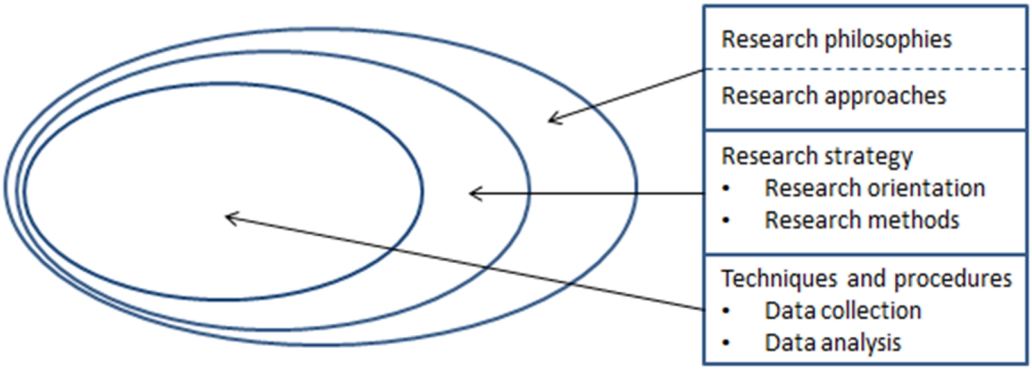

Figure 1.2. *Key concepts outlining the research (adapted from Saunders et al. 2009, p.108)*

The layered model, described in the above picture, suggests that ultimately the research design consists of important choices researchers have to make on each layer. Selections made on one layer are affected by the previous layers – e.g. choices on paradigm layer will fundamentally affect the strategic choices. (Saunders et al. 2009.) It is also important to notice that there are a number of different options on each layer (especially considering different research methods on strategic layer), and selecting most suitable options should follow a careful consideration of the research problem at hand (Ghauri & Grønhaug 2005, p.30).

In this study, we recognize the generated research problem and research questions as essential drivers for formalizing the research design (see e.g. Ghauri & Grønhaug 2005; Saunders et al. 2009). We also take into consideration the layered perspective (Saunders et al. 2009), and acknowledge that the paradigmatic and philosophic perspectives fundamentally steer the research and affect the selections on strategic and practical layers (Guba & Lincoln 1994; Olkkonen 1994, p.28). Rationalizing the selections of different domains and methods on each layer, and explaining their influence on this research is of great importance, and the aim of the following sub-chapters. Following the layered model, we proceed from conceptual explorations of research philosophies and approaches towards more practical views of conducting research, namely strategic choices and research methods.

1.2.1. Research philosophy and approaches

Research philosophies and approaches form the outmost layer of Saunders' et al. (2009, p.108) research model. As it was already said, fundamental foundations of any research lie in paradigmatic and philosophic issues (Guba & Lincoln 1994). Essentially these issues require reflection on research setting and researcher's backgrounds (Ghauri & Grønhaug 2005, p.14; Koskinen et al. 2005, pp.33–37) through *ontology* – the researcher's view of the nature of reality – and *epistemology* – the researcher's view regarding what constitutes acceptable knowledge (Saunders et al. 2009, p.119). In a way

researcher's own world view implicitly determines the direction for the whole research. However, understanding these taken-for-granted assumptions and realizing their features let us challenge them and change our behavior (Saunders et al. 2009, p.109). Identifying the suitable philosophical perspectives and holding on to them during the research process make the research congruent.

Concluding from the paradigmatic perspectives research philosophy can be defined as an overarching term related to the development of knowledge and its nature in relation to the research (Saunders et al. 2009, p.600). The definition is not unambiguous, and vague terminologies, as well as a vast number of different philosophical perspectives make understanding the concept difficult (Toivonen 1999, pp.10–11). In research science debates revolve around numerous different research philosophies – for example, positivism, realism, interpretivism, pragmatism (Saunders et al. 2009, p.108), social constructivism (Koskinen et al. 2005, pp.33–34), and hermeneutics (Bleicher 1980; Olkkonen 1994), often resulting in paradigmatic dichotomies (Toivonen 1999, pp.68–69), such as subjectivity vs. objectivity (Saunders et al. 2009, p.120). Dichotomies often simplify the debate into two perspectives that are the exact opposites of one another. Thus, selecting either end of the dichotomy is extremely difficult, as research problems rarely fit into only one domain of research philosophies (Saunders et al. 2009, p.109). And in the end, the selection merely illustrates subjective and instinctive features of the researcher (Toivonen 1999, p.69). Thus, it is impossible to determine the 'best research philosophy', as they are equally better at doing different things in different contexts.

Koskinen et al. (2005, pp.36–37) argue that philosophical debate should not be taken as a model for research science. Instead, they suggest more practical approaches. Firstly, philosophic approaches offer tools for positioning the research. Secondly, debate works as diagnostic – mixing philosophic perspectives from both extreme ends of a dichotomy may lead to contradictions later on. Finally, different perspectives are merely suggestions, some of them being more popular than other in specific science areas; mutual understanding around these issues rarely exists. (ibid.) Which philosophic perspective to choose is thus dependent on the nature and settings of the study.

This research can be categorized as a business research as it ultimately seeks answers for business phenomena, namely value creation, even though the objective of the study is not clearly connected to firm's problem-solving or decision-making activities (Zikmund et al. 2012, p.5). Moreover, the research aims to expand the limits of knowledge in general, and is not aimed at solving a particular pragmatic problem. Thus this thesis holds its significance and value more towards society in general than any particular organization. (Saunders et al. 2009, p.9.)

The research setting, complexity of business environments (Ghauri & Grønhaug 2005, p.8), and the need for understanding also social actors and interaction favors

interpretivism over positivism (Saunders et al. 2009, p.119). Positivism generally assumes that reality is objectively given (Myers 1997), and tries to generate law-like generalizations, reducing the phenomena to its simplest elements. This is often not desired or even possible when a holistic understanding of a business phenomenon is sought. Interpretivism, building on hermeneutics, attempts to understand phenomena through the meanings people assign to them (Myers 1997) by socially constructing the truth (Saunders et al. 2009, p.119) and complementing the researcher's pre-understanding with details emerging from the research (i.e. hermeneutic circle) (De Geer et al. 2004, pp.325–326). Interpretivism is also context bound and has no claims of representing objective truth since other interpretations are equally possible (Kasanen et al. 1991, p.311; De Geer et al. 2004, p.335; Vuori 2011, pp.13–14).

Concluding the philosophic discussion regarding this thesis, we understand that positivism's contribution to social sciences emphasizes the explanation and understanding of human behavior. Hermeneutics, in turn, considers emphatic understanding of social actions. (Bryman & Bell 2007, pp.17–18.) Interpretivism seeks understanding of concepts through understanding of human behavior, social roles and the meanings we interpret for these roles (Saunders et al. 2009, p.116). Thus, interpretivism represents a clash between the two mentioned stances (Bryman & Bell 2007, p.17), and withholds suitable points of emphasis for this thesis.

The second layer of the model describes the general research approach, which positions the gathering of knowledge in relation to theory (Ghauri & Grønhaug 2005, p.16), and is thus closely attached to philosophic matters (Saunders et al. 2009, p.124). Two traditional research approaches are deduction and induction (see e.g. Toivonen 1999, p.46; Ghauri & Grønhaug 2005, p.14; Bryman & Bell 2007, p.14; Saunders et al. 2009, p.124). In short, deduction draws conclusions through logical reasoning using former theories as foundations and testing these theories with empirical scrutiny. Induction, in turn, draws generalist conclusions from empirical observations making new or improving former theories. (Ghauri & Grønhaug 2005, pp.14–15.) Even though the two concepts seem the exact opposites, line between them is rather vague – dualistic labeling may thus be misleading, and it is often useful to combine both approaches (Saunders et al. 2009, pp.124–127). In order to clarify the selection between induction and deduction, we have to explore the points of emphasis in both concepts, view them through the purpose of this study, and also take into consideration the philosophic stance determined earlier.

Pure deduction is quite rare in social sciences (Toivonen 1999, p.46) due to its stance towards positivism, highly structured form and strict principles, researcher independency of research subject, and the application of controls in selecting samples and ensuring validity of data (Saunders et al. 2009, p.127). Induction, however, allows more flexible structure, which permits changes in emphasis during the research process;

is less concerned with need to generalize; realizes researcher as part of the research process; and aims at close understanding of the context through the meanings humans attach to events (ibid.). As we can see induction and its characteristics support naturally the philosophic stance of this study. However, the research approach is not purely inductive as the knowledge is built from the interaction of empirical findings and literature. Considering also the purpose of the study (see chapter 1.1.2.), some understanding regarding causal relationships of variables, that is traditionally a characteristic of deduction (Saunders et al. 2009, p.127), is sought after. Hence, the research approach of this study is inductive with minor adjustments towards deduction – sometimes this kind of approach that mixes induction and deduction is called abduction (Vuori 2011, p.14).

As the layered model of research suggests, the philosophic stance and selected research approaches guide the selection of research strategy and methods (Olkkonen 1994, p.28; Saunders et al. 2009, p.108). Next chapter discusses general research strategies and methods in relation with the research problem and purpose of the study, thus rationalizing the selection of particular strategy for this thesis.

1.2.2. Research strategy and methods

Research strategy is defined as *"a general plan of how the researcher will go about answering the research questions"* (Saunders et al. 2009, p.600). In literature the same concept is also called research approach, research paradigm (Kasanen et al. 1991, p.313; Olkkonen 1994, pp.59–60), or research methodology (Vuori 2011, p.16) which causes a great deal of confusion around the discussion. In this thesis we rely on the above definition and use the term research strategy to describe not only the utilized research methods and techniques but also to explain how the selected methods contribute in fulfilling the objectives of the research (Olkkonen 1994, p.81; Saunders et al. 2009, p.141). In addition, we acknowledge the need to position the selected strategies in accordance with the purpose of the study (e.g. whether the research is descriptive, exploratory etc.) (see e.g. Ghauri & Grønhaug 2005, p.58; Saunders et al. 2009, pp.138–140), and in relation with the development of knowledge (i.e. philosophical stance) and the roles of theory and empirics (Kasanen et al. 1991, p.316).

Fundamentally a division between qualitative and quantitative research strategies is considered helpful when struggling with methodological issues (Bryman & Bell 2007, p.28). Quantitative research strategies are often related to methodologies in data collection and analysis that generate or use numeric data. Qualitative, in turn, refers to use of non-numeric data (e.g. words and pictures) in data collection and analysis procedures. (Saunders et al. 2009, p.151.) Philosophical choices of hermeneutics and interpretivism, as well as inductive approach suggest a qualitative research strategy for this thesis (Ghauri & Grønhaug 2005, p.110; Bryman & Bell 2007, p.28; Zikmund et al.

2012, p.135). Qualitative strategy emphasizes understanding and interpretation; has a holistic perspective over the research subject; and involves researcher intimately to the research process (Ghauri & Grønhaug 2005, p.110; Zikmund et al. 2012, p.135). Also when the research attempts to develop in-depth understanding of some phenomena, or when the research objective is to learn how a phenomena occurs in its natural settings, qualitative approach is often considered very useful (Zikmund et al. 2012, pp.132–135). In general, qualitative research is often seen especially fruitful for business research (see e.g. Ghauri & Grønhaug 2005, pp.110–112; Koskinen et al. 2005, p.15).

Selecting qualitative research approach on strategic level helps to narrow down the vast number of different methodological and technical choices (see e.g. Ghauri & Grønhaug 2005, p.113) but lacks the ability to create deeper understanding on which method or what kind of combination of methods and techniques is most suitable for this research. Kasanen et al. (1991, pp.316–317) and Olkkonen (1994, pp.59–61) describe five research orientations, which are widely used in Finnish business research: concept-analytic, nomothetic, action-analytic, decision-centric, and constructive. Categorization positions the five orientations based on two main paradigms, namely descriptive-normative and theoretic-empiric (ibid.) (see figure 1.3.).

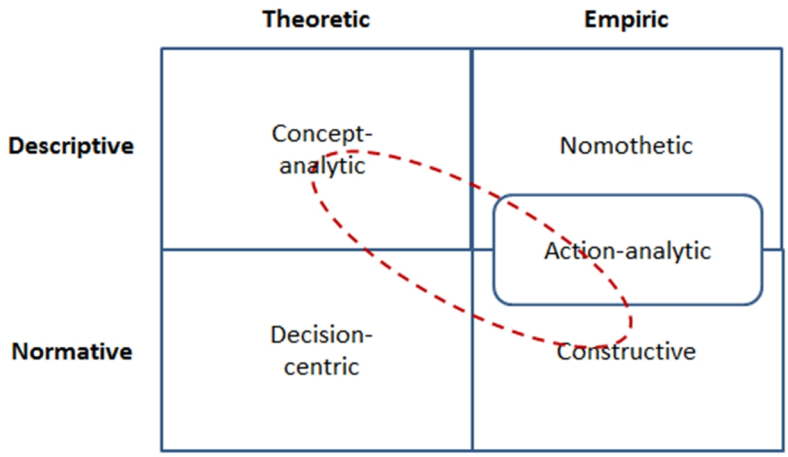

Figure 1.3. *Positioning of research strategy in Business Research Strategy framework (adapted from Kasanen et al. 1991, p.317; Olkkonen 1994, p.78)*

As we can see from the above picture, this research follows concept-analytic, constructive and action-analytic orientations. Following multiple orientations is quite normal for business research in general (Olkkonen 1994, p.80). Selection grounds on the philosophical stance of interpretavism and hermeneutics, when concept-analytic and action-analytic approaches are a natural choice; nomothetic, decision-centric and constructive orientations are often leaning towards positivism (Olkkonen 1994, p.80). Concept-analytic orientation expresses the theoretic and descriptive, or explanatory (causal) (Ghauri & Grønhaug 2005, p.59; Saunders et al. 2009, pp.140–141) emphasis in the research. The selection suggests building of new concepts based on earlier

conceptual theories and research through analysis and synthesis. The main objective is not to verify but argument and make suggestions based on the results of the study. (Olkkonen 1994, p.61.) In addition, descripto-explanatory stance emphasizes "*portraying an accurate profile*" of an event or phenomena and finding causal relations between variables (Saunders et al. 2009, p.140) which is in-line with the objectives and research questions of this study (see chapter 1.1).

Action-analytic and constructive orientations represent the empiric side of this study. Action-analytic research aims to a holistic understanding of the research problem by using hermeneutic and interpretivism approaches in few selected cases that illustrate the phenomena (Olkkonen 1994, pp.72–73). Constructive orientation supports heuristic and iterative approach in building constructions through empiric findings (Olkkonen 1994, p.76). In this study this is realized through iterative use of former theories in congruence with empiric findings and by illustrating how theories work in practice, and thus constructively building answers to research problems. Even though generalization and verifying the empirical results are essential parts of constructive orientation (Kasanen et al. 1991, p.317), this is not the case in this study, as we do not try to find normative rules for the phenomena.

After viewing the fundamental orientations of the study, we can focus on more practical means of implementing the study, namely methodological choices and data collection techniques. A division between research methods and data collection techniques is often acknowledged (see e.g. Ghauri & Grønhaug 2005, pp.110–113; Saunders et al. 2009, p.138). Methods refer to rules and procedures that act as tools for problem solving, and techniques are more concerned of 'how' to achieve this (i.e. step-by-step guides for collecting and analyzing data). Thus, case study, survey, and field experiments represent research methods, and interviews, surveys and observations are examples of techniques. (Ghauri & Grønhaug 2005, p.109.) Choosing appropriate methods and techniques depends on the research problem and the nature of the study.

Since the nature of this study is qualitative and the context is related closely to business phenomena, a multi-method approach is appropriate (Morse 2003, p.189; Marschan-Piekkari & Welch 2004, p.164; Saunders et al. 2009, pp.152–153). Multi-method approach allows utilization of different methods for different purposes in the study (Saunders et al. 2009, p.153), and establishes another perspective on the matter at hand providing a more comprehensive picture than single method would generate (Morse 2003, p.205). Taking advantage of these benefits we applied a multi-method approach and selected case study, literature review and netnography as methods followed by focused interviews and participant observation as data collection techniques (see figure 1.4).

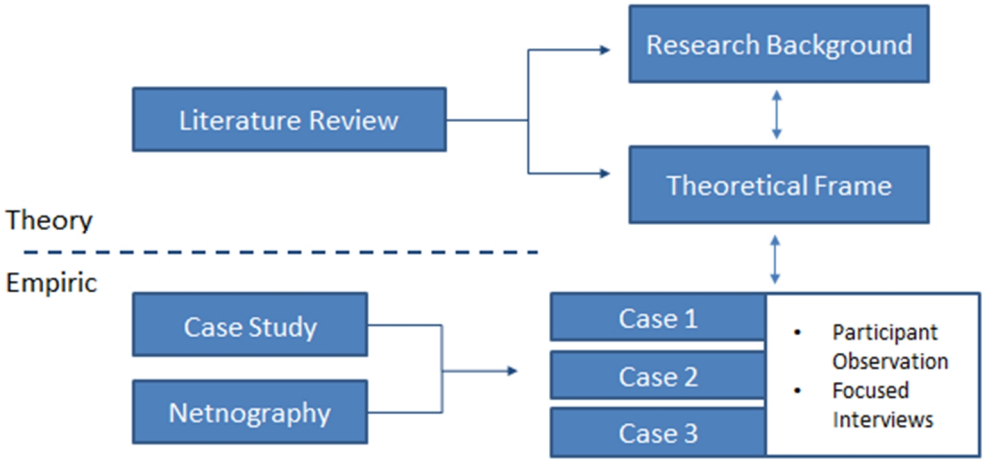

Figure 1.4. *Methodological selections and their relations*

Preceding the empirical part, a literature review was conducted. The literature review in this study serves all the traditional purposes of reviewing past literature; it frames the problem under scrutiny, identifies relevant concepts and facts, and positions the study among the state of the art (Ghauri & Grønhaug 2005, p.52). Thus, the literature review revealed the research gaps related to the research subject, helped to formalize research questions, and provided a theoretic frame which worked as a foundation for the empiric part (Saunders et al. 2009, p.61).

Empiric part of the research consists of case study and netnography. Case study is an empirical inquiry investigating a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident (Yin 2003, p.13). This is often the case with business context, making case study a natural choice for business research (see e.g. Gummesson 1993, pp.4–6; Ghauri & Grønhaug 2005, pp.115–116; Koskinen et al. 2005, pp.154–155; Saunders et al. 2009, pp.5–6; Zikmund et al. 2012, pp.139–141). Also the selected orientations – action analytic and constructive – strongly support the selection of case study approach (Olkkonen 1994, pp.72–77). In addition, understanding value creation in novel ICT based approaches is the main objective of this study. Deliberately viewing this context through multiple cases offers a robust and comprehensive perspective (Yin 2003, pp.46–47), and helps to limit the research subject into processable entities (see chapter 1.1).

In parallel with case study approach, a netnography was conducted in the selected cases. Netnography is a relatively new research method which has developed from the foundations of ethnography in social sciences in the late 1990s. Kozinets (2010, p.60) defines netnography as *"participant observational research based in online fieldwork"* which *"uses computer-mediated communications to arrive at the ethnographic understanding and representation of a cultural or communal phenomenon"*. Kozinets was but one among the many researchers to realize that the recent cultural and technological developments, especially in the field of ICT, would also affect the

practices of conducting research (see e.g. Hine 2000; Wittel 2000; Dholakia & Zhang 2004; Kozinets 2007; Gobo & Diotti 2008; Murthy 2008; Beneito-Montagut 2011). Traditional research methods seemed unconventional and lacked the ability to collect multiform digital data when the research settings started to move to online environments, and when computers and other technology started to mediate interaction between the users (Kozinets 1998; Kozinets 2007, p.130; Williams 2007). Thus, in order to cope with these developments, the traditional methods also needed to be adjusted (Stewart & Williams 2005, p.396) to match the cultural change towards a merged view of offline and online environments (Garcia et al. 2009, p.52). Netnography is a research method developed to meet the changing requirements of online qualitative research.

Since the late 1990s netnography has been used especially in marketing research (for which it was originally developed) to study the behavior of customers and users in online communities and social networks (see e.g. Kozinets & Handelman 1998; Kozinets 2002; Maclaran & Catterall 2002; Brown et al. 2003; Muñiz & Schau 2005; Kozinets 2006). Despite the strong exploitation in commercial marketing research, netnography has also been used to study community based innovations (Füller et al. 2006; Füller et al. 2007), a B2B brand community (Mäläskä & Nadeem 2012), knowledge building in open source communities (Hemetsberger & Reinhardt 2006), consumer education (Sandlin 2007), online communication and emotions (Beneito-Montagut 2011), and sensitive research topics, such as cosmetic surgeries (Langer & Beckman 2005), sexuality, suicides and deviance (Murthy 2008, p.839). The conducted case studies reveal the flexible nature of the research method, and in addition to that, Gobo's and Diotti's (2008) listing of online netnography resources (e.g. specific academic journals and research communities) also indicate that netnography is becoming more acknowledged and frequently used in social sciences in general. This also indicates that netnography is not only becoming more popular in studying eCommerce in commercially oriented qualitative research settings (Dholakia & Zhang 2004) but also in many other fields of science where the research questions require qualitative analysis of online sites, platforms, communities and user behavior.

After mentioning this, we feel quite comfortable in accepting netnography as a suitable method also for this study where the selected cases mix both online and offline environments, and focus on a specific phenomenon, namely value creation. In addition, having foundations on ethnography the selected method brings an important perspective towards hermeneutics and interpretivism, which are the philosophical stances in this study, and lets us importantly discover the social activities in value creation systems, and thus contribute in finding out how the system works as a whole. This is also one of the key objectives in the study. Even though the methodical choices are parallel, we see case study more like a frame and a unit of analysis, where the other method (netnography) and data collection techniques are utilized (see figure 1.4).

1.2.3. Data collection and analysis techniques

The final and innermost layer of the research onion describes the used data collection and analysis techniques in relation to this research. In the previous chapter we rationalized the selection of research methods – literature review, case study and netnography – for this research. Literature review, or more generally reviewing past literature on the research subject, is quite evident for any research, and thus requires no further rationalization. However, some important aspects about implementing the review need to be discussed.

The literature review was conducted rather traditionally by following guidelines of Saunders et al. (2009, p.60), which consists of iterative process for reviewing literature (i.e. defining parameters, generating keywords, conducting search, obtaining and evaluating literature, and recording). Digital library services, research databases, and well-known search engines, such as ExLibris SFX, IEEE Explore, Emerald Journals and Google Scholar, were used while searching relevant resources. Typically, a search with relevant keywords and a skimming through abstract or the whole article preceded inclusion or exclusion. Also searching forward and backward referencing of cited articles resulted in a discovery of relevant resources.

Conducting the literature review included critical evaluation (Ghauri & Grønhaug 2005, p.53) regarding inclusion and exclusion of different resources. Thus the guidelines of critical review were used while exploring the resources to develop a good understanding and insight into previous research (see e.g. Saunders et al. 2009, pp.58–65). The importance of evaluating and critically reviewing the cited references during the research process is recognized as a factor affecting the total validity of the study. Most articles cited were chosen from peer-reviewed academic and business journals, such as *Strategic Management Journal* and *Harvard Business Review*, and from the proceedings of well-known conferences, for example *Hawaii International Conference on System Sciences (HICSS)*. In some cases other publications, such as books, textbooks and industrial reports, were also cited, taking into consideration the authors' agendas, personal ambitions etc. to avoid biases.

The other selected methods, case study and netnography, are both rather flexible in nature and suggest a combination of different data collection techniques (Yin 2003, pp.13–14; Kozinets 2007, p.132). They both also benefit from prior development of theoretical propositions to guide data collection. After considering multiple techniques (see e.g. Ghauri & Grønhaug 2005, p.113; Saunders et al. 2009, pp.288–412), we selected participant observation and focused interviews.

As stated already in the definition of netnography, participant observation is a fixed part of the selected method. Participant observation extends traditional observation, where

the researcher listens and watches other people's behavior aiming to some type of learning and analytical interpretation (Ghauri & Grønhaug 2005, p.120) by actively participating and assuming different roles (Yin 2003, p.93; Saunders et al. 2009, p.293). In our study the observation was conducted in online environment. Instead of observing real-life situations and interactions between people online, participant observation included not only interpretation of textual discourses (see e.g. Hine 2000) but also observing of user behavior online in relation to the cases on multiple sites and media, and collecting multimedia data (Williams 2007).

Focused interviews follow the basic nature of interviews with few distinguishing aspects, such as persons involved are known to have involved in a particular situation, and interview is focused on subjective experiences of persons exposed to a pre-analyzed situation (Merton & Kendall 1946, p.541; Merton et al. 1990, pp.3–5). These aspects suit well this research as the cases are considered to be that 'particular situation' and participant observation and extensive literature review ground the analysis prior to interviews. Focused interviews also resemble semi-structured and unstructured interviews that are often exploratory and explanatory in nature (Saunders et al. 2009, pp.322–323), which suits well the orientations of this study. Interviews are also commonly utilized together with case studies (Yin 2003, p.89).

Combining these two data collection techniques let us form a comprehensive picture of the studied phenomenon in each of the cases. While participant observation views the cases externally from the viewpoints of users on online platforms, the interviews cut deep internally. Both sides are required to find answers to the research questions. Also, using both methods iteratively leads to a verification of data collected with each method, which is often considered an important part of research (see e.g. Ghauri & Grønhaug 2005; Saunders et al. 2009). More extensive descriptions of the selected methods and their implementations in relation to this research are discussed in chapter 4.

Figure 1.5. concludes this chapter and summarizes the selected research design by following the layered model of research. Selections of each layer are carefully considered in relation with the objectives of this study, and thus it illustrates how the answers to research questions are approached.

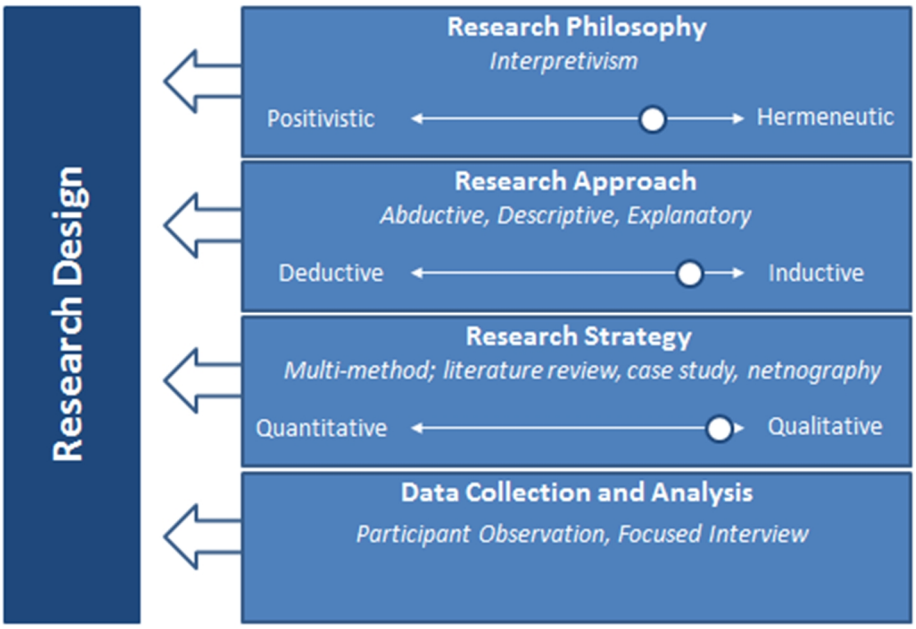

Figure 1.5. *Summary of the research design of this thesis (adapted from Vuori 2011, p.13)*

Before entering the theoretical part of this study we shortly discuss the structure of the thesis by viewing the general outline, as well as explaining the purposes of each chapter. The following chapter also describes how theory and empiric parts are positioned in this study, and connects some chapters with related research questions. Thus the next chapter can be used as a general guideline for reading this thesis.

1.3. Structure of the thesis

After discussing the research backgrounds and the actual research design, we can shortly view the outline of the thesis and discuss the relevance of different chapters considering research questions. The thesis is structured into four different parts: introduction, theory, empiric and conclusions. The structure follows roughly the same framework that was constructed for the research questions in chapter 1. The first chapter, being a namesake of the first part, offers an introduction into the subject under scrutiny and describes the backgrounds of the study by generating proper problem statements and research questions from the existing research gap. The first chapter also explains the objectives of the study and describes in detail the rationalization for the used research design (i.e. research philosophies, approaches, strategies, and data collection and analysis methods).

The second part, namely the theory part of the thesis consists of two chapters outlining the key theoretical concepts of the thesis suggested by the introduction. Chapter 2 focuses on value creation in networked environments. The chapter builds on the conceptual shifts in value creation and economics focusing on the current trends and

their characteristics by introducing and analyzing some well-known value creation models for networked environments. The second theory chapter (chapter 3) discusses the novel social media and ICT-based value creation approaches, at first viewing the general environment, and then focusing on the three concepts (i.e. crowdsourcing, gamification and swarm work) which are important for the upcoming empiric part and the cases. Both theory chapters are based on the extensive literature review conducted for the purposes of this study.

The empiric part of the study consists of two chapters (chapters 4 and 5). Chapter 4 introduces and discusses the used research methods more in detail (cf. the rationalization of methods in chapter 1). In addition the chapter discusses the implementation of the empiric research by describing how the selected methods and data collection techniques were used in this research. Chapter 5 presents the results and analysis for the empiric part. The chapter is divided into three different sections, each of them focusing on one case; cases and the collected data are first introduced, and after that the data is analyzed by using the selected analysis framework described in the previous chapter.

The last part of the thesis, discussion and conclusions, consists of one chapter (chapter 6). Firstly, the chapter synthesizes the findings from the whole research, and discusses them from the perspective of the research questions. After the general discussion, the chapter summarizes the key findings by answering the research problem statement, and discusses the scientific contribution of the study. Finally, the chapter also brings forth the limitations of the study and suggests some important aspects for future research.

2. VALUE CREATION IN NETWORKED ENVIRONMENTS

Value creation is a special business term which has had a great deal of attention among academic researchers and business persons. Value creation is in the core of conducting business; it is delivered by the business model and determines the benefits and purpose of business practices (see e.g. Shafer et al. 2005; Chesbrough 2007; Vargo et al. 2008). Even though gaining financial benefits is the most obvious driver for value creation, the full essence of the concept has transformed drastically over time, and especially quite recently, due to changes in understanding of business environments, developments in ICT, and the emergence of novel e-business models (see e.g. Prahalad & Ramaswamy 2000; Amit & Zott 2001, pp.493–494; Prahalad & Ramaswamy 2004; Lyman et al. 2009, p.119).

In this chapter we discuss briefly the nature of value and how it has changed over time parallel to the economic changes and fashions of conducting business. We also identify some of the key differences between the novel ways of creating value and more traditional value creation approaches. Finally, we view some well-known value creation frameworks which help us to understand and analyze value creation in networked environments.

2.1. Long lasting legacy

The debate over the definition of value is ancient, dating all the way back to Aristotle's efforts for distinguishing the differences of things and their attributes as well as the commensurable quantity of substance achieved in exchange of things. His reasoning resulted in dualistic definition of 'value-in-use' and 'value-in-exchange'. (Dixon 1990, p.338; Vargo et al. 2008, pp.146–147.) However, it was during the medieval times when the dualistic view of value started to gain position in economic analysis (Dixon 1990, p.338), and in 18th century Adam Smith brought the discussion of value and value creation into the development of economics (Vargo et al. 2008, p.147). Smith (1776) argues that value-in-use is determined by the utility of some particular object and the value in exchange describes the power of purchase which the possession of that object conveys. Smith also suggest that labor is the best measure for determining the real value or worth of everything: "*What every thing is really worth to the man who has acquired it, and who wants to dispose of it or exchange it for something else, is the toil and*

trouble which it can save to himself, and which it can impose upon other people." (ibid., pp. 34-36.)

During neoclassical economics in the early 20th century, following Smith's legacy the focus of economic science transformed from rather static modification of prices and wages (e.g. Smith's theory) to patterns of inputs, outputs and prices under conditions of hypothetical market equilibrium (Nelson 2007, pp.27–29). The general logic of economics was still goods-dominant and based on nominal exchange of value (Vargo et al. 2008, p.147). However, in 20th century several other ideologies emerged that changed the economic science and perspectives of value creation. Schumpeter (see Schumpeter 1939; 1942) started a shift in value creation by stating that value creation and economic development is achieved through innovation (Galunic & Rodan 1998, pp.1193–1194; Amit & Zott 2001, p.497). Following technological development through novel combinations of resources and services (Schumpeter 1934, pp.65–66.) leads to 'creative destruction': Even though certain rents become available and generate competitive advantage and value to entrepreneurs in a form of new innovations, they soon diminish as the innovations become established business practices (Amit & Zott 2001, p.496). Thus Schumpeterian Innovation represents rather dynamic model where enterprises need constantly adjust their actions to achieve rents and competitive advantage.

Following Schumpeterian perspective, Resource Based View of the Firm (RBV), views value creation through marshaling and uniquely combining firm's resources and capabilities (see e.g. Penrose 1959; Wernerfelt 1984; Barney 1991). Resources can be assets, capabilities, organizational processes, firm attributes, information, knowledge etc.(Barney 1991, p.101) – basically anything that could be thought of strength or a weakness of a given firm (Wernerfelt 1984, p.172). Not all of the resources accrue economic value: According to Barney (1991, pp.105–106) only resources that are valuable (in a sense that they exploit opportunities), rare, imperfectly imitable, and lacking substitutes may generate sustainable competitive advantage and superior economic value. Thus, in order to create value firm's services have to resemble the unique combinations of these resources (Amit & Zott 2001, p.497).

Another theory to describe value creation in economic context is Transaction Cost Economics (see e.g. Williamson 1979; 1981; 1989). John R. Commons (in 1934) first introduced that transaction is the basic unit of economic analysis (Williamson 1981, p.550) Transactions are transfers of goods and services through a technologically separable interfaces (Williamson 1981, p.552) – for example simple payment transactions for goods. Following Commons' work Coase (1937, pp.390–391) agreed that the cost of using a price mechanism seems to be the key to profitable establishing of businesses. Meaning that in normal conditions undertaking transactions require assessment of different expenses (e.g. search and information, bargaining and policing

costs) and execution follows when the expenses are lower than the gained profits (Dahlman 1979). Essentially TCE is also about transforming firm's boundaries into a decision variable through which enterprises can decide whether to internalize operations or rely on the markets (Coase 1937; Williamson 1981, p.550) In this process, transactions are the economic counterpart for friction; less the friction, the more smoothly the process runs. Most often this is viewed through minimizing the expenses regarding the transactions but it includes also enterprise level planning; for example relating the operational parts to one another and designing the organization of human assets etc. (Williamson 1981, pp.549–552).

Porter and his theories on value creation (see e.g. Porter 1985; Porter & Millar 1985) are certainly familiar to any economist. Porter's value chain divides the operations of a firm into two categories: primary activities and supporting activities. Primary categories are involved in the physical creation of the product, its marketing and delivery. Supporting activities provide the inputs and infrastructure for the primary activities. Company's value chain consists of these interdependent 'value activities' and the linkages between them which often create trade-offs. Managing the trade-offs may lead to competitive advantage. (Porter & Millar 1985, p.150.) Each of the linkages in the chain contributes to value creation of a company, and in the end the value is measured by the total revenue: *"Value is the amount buyers are willing to pay for what a firm provides them"*(Porter 1985, p.38). Porter's value chain is not limited to a company level. Company's value chain is embedded in a larger stream of activities, namely '*value system'*. Value system extends upwards to supplier's activities and downwards to buyer operations. By managing these linkages companies can achieve competitive advantage over their rivals. (Porter & Millar 1985, pp.150–151.)

Even though the above mentioned theories are often seen a fundamental part of modern economics, they individually lack the proportions to describe today's value creation (Amit & Zott 2001, pp.493–494). Vargo et al. (2008) bring forth a paradigm change in economics and value creation from goods-dominant (G-D) logic into service-dominant (S-D) logic. For example Porter's value chain might be useful for describing value creation in traditional manufacturing industries, but lack the ability to describe that in service industries (Stabell & Fjeldstad 1998, p.414). Thus service dominant logic withholds a transformation from "*largely raw material processing and manufacturing activities to the processing of information and the development, application, and transfer of new knowledge"* (Teece 1998, p.58). In addition, tremendous developments in ICT and Internet revolutionized the way how business is conducted (Timmers 1999, pp.3–4; Janneck et al. 2008, p.501). Swift emergence and expansion of Internet, and rapid decline in computing and communication costs, have allowed the development of new ways to create and deliver value (Amit & Zott 2001). Business environments now consist of an integrated view of physical and virtual environments (Janneck et al. 2008, p.502). Companies are also heavily shifted towards globalization and specialization

which enables a need to analyze and manage more relationships with different business entities, such as partners, suppliers, competitors and other organizations. (Lyman et al. 2009, p.120.)

2.2. Business models and value creation tangle

Economic transformation led to re-thinking of traditional theories. Porter and Millar (1985), already in 1980s, discussed the role of information and ICT concerning value chain theory. More recently also RBV theory received an extension towards knowledge economy, namely Dynamic Capabilities (see e.g. Teece et al. 1997; Winter 2003). These new extensions together with more traditional characteristics of economics (e.g. characteristics from Schumpeterian Innovation and TCE theories) form the foundations for value creation today (Amit & Zott 2001, p.500). Also increasingly, network perspectives (see e.g. Thorelli 1986; Gulati 1998; Gulati et al. 2000; Håkansson et al. 2009) and business model concepts started to gain attention (Zott et al. 2011a, p.4) during this transformation, even though the concepts themselves have longer histories (Dunn 2005, p.145; Teece 2010, p.174).

Even today, business model theories lack the theoretical grounding in economics and business literature making its conceptual base very thin (Shafer et al. 2005, p.200; Teece 2010, p.175; Zott et al. 2011a, p.20). However, many authors have made efforts on defining this concept and describing what it means for businesses (see Zott et al. 2011a). Ultimately business model describes the benefit a company will deliver to its customers, how the company organizes to do so, and how it will capture a portion of the value that it delivers. Thus, business model articulates the logic and data that support company's value proposition and viable structures for revenues and costs for the company delivering the value. (Teece 2010, p.179.) In fact it is safe to assume that all businesses – explicitly or implicitly – employ a business model (Teece 2010, p.191), and thus the number of possible business models is immense, especially after the recent breakthroughs in ICT and the emergence of the Internet (Timmers 1999, pp.3–4; Casadesus-Masanell & Ricart 2010, pp.195–196; Mahadevan 2000, p.55; Teece 2010, p.178; Zott et al. 2011a, p.7).

As the business models morph over time according economic transformation, developing technologies and evolving legal structures (Teece 2010, p.177), recently the trend has shifted towards networked approach and e-business models (Amit & Zott 2001). Many models have emerged: For example, Teece (2010) explains how more traditional business models have evolved towards e-business models through digitization; Timmers (1999, pp.35–45) discusses of 11 different models varying from e-shops to information brokerages; Wirtz et al. (2010) reveal a 4C-typology (content, commerce, context, connection) for Internet based business models; and Applegate *(2001)* introduces six models (e.g. focused distributors, portals, and infrastructure

providers) that illustrate the networked approach. The list is unending, and yet new models are generated all the time (see also Chapter 3 for novel concepts). However, it is relevant to understand that these models have several things in common – one of them is that they all try to describe how businesses are currently attempting to benefit and create value from new business opportunities mostly enabled by Internet technologies (Zott et al. 2011a, pp.7–11).

These newly emerged business models also emphasize value creation and value capture, as well as a system perspective on 'how to do business' (Shafer et al. 2005; Zott et al. 2011a, p.20; Zott et al. 2011b, p.2). The digital economy allows enterprises to explore and experiment new forms of value creation mechanisms where value is co-created for multiple users by a firm and a plethora of partners in a network (Zott et al. 2011a, p.11). Vargo et al. (Vargo et al. 2008) describe the key differences in value creation that occurred during the economic development from G-D logic to S-D logic (see table 2.1)

Table 2.1. *Value creation through G-D and S-D logics (adapted from Vargo et al. 2008, p.148)*

	Goods-Dominant Logic	**Service-Dominant Logic**
Creator of value	Firm, often with input from other firms in a supply chain	Firm, network partners, and customers
Process of value creation	Value is embedded in goods or services; value is added by enhancing or increasing attributes	Firms propose value through market offerings; customers continue value creation through use
Purpose of value	Increase wealth for the firm	Increase adaptability, survivability, and system wellbeing through service of others
Role of a firm	Produce and distribute value	Propose and co-create value; provide service
Role of customer	To 'use up' or 'destroy' value	Co-create value through the integration of firm-provided resources with other private and public resources

Economic change from goods-dominant logic to service-dominant logic is not the only factor affecting the novel value creation. The rise of the digital culture has fundamentally affected the interaction of businesses, their customers, partners and users. First Web 1.0 (i.e. the Internet) revolutionized the way of doing business through its features such as ubiquity, availability, global reach, digitization, and interaction (see e.g. Timmers 1999, p.10; Kothandaraman & Wilson 2001, pp.387–388). A few years after the millennium, came Web 2.0 which increasingly changed how businesses perceive customers and users by introducing terms such as mass-collaboration, social applications, and collective intelligence (see e.g. Tapscott & Williams 2006). Web 2.0 became quickly an essential part of, not only individual user's everyday life, but also a key element of business environments (Murugesan 2007, pp.34–35).

Through these views customer is no longer a passive buyer or consumer but a key part of the enhanced network where they co-create and extract business value. This suggests that value is seen and understood as 'value-in-social-context', emphasizing the activities, positions and roles of actors involved, and the perceptions of value related to the specific contexts (Edvardsson et al. 2011, pp.336–337). Thus, customer experience has become the key driver of value creation activities (Prahalad & Ramaswamy 2000, p.80; Prahalad & Ramaswamy 2004, p.13). At the same time the resource base of a firm extends from its own boundaries to other companies' and customers' competencies (Prahalad & Ramaswamy 2000, p.82; Biem & Caswell 2008; Lyman et al. 2009, p.125), and value is created by combining these competencies for the wellbeing of the whole system (Prahalad & Ramaswamy 2000, p.82). Thus, network perspective brings the focus from assessing the value creation through dyadic transactions between business entities to more complicated and decentralized exchange or co-creation of value with two or more parties (Allee 2000; Biem & Caswell 2008; Allee 2009; Briggs 2009; Dijck & Nieborg 2009, p.863). This also questions the traditional dualistic division of B2B and B2C sectors, when processes and business functions extend beyond company borders (Werthner et al. 2008, p.189) enabling models where businesses and organizations, as well as consumers, citizens and employees interact in an interrelated network (see e.g. Gummesson 2004; Gummesson & Polese 2009).

In addition, compared to more traditional value creation models (e.g. TCE and Porter's Value Chain), where value was merely a proportion of a product or service (Vargo et al. 2008, p.148), and the benefits were often monetized and measured mostly through gained revenue, as well as viewed from the firm's perspective, 21st century value creation recognizes also the importance of intangible assets and their effect on conducting business through exchange (Allee 2002), as well as the value accumulated from the relations of business entities weaving around products and services (Briggs 2009, pp.38–39). To put it simple: The traditional return on investment criteria do not work anymore (Allee 2000, p.39).

The transformation of value creation over time in accordance with economic change has not led business managers to an easy position. Understanding value co-creation in dynamic network environments is surely challenging. In digital era the customers cannot be controlled in a traditional way; customers and users initiate dialogue not only towards the company but also interact passionately with other users (Prahalad & Ramaswamy 2004, pp.11–13). These social networking patterns are mapping the social ecosystem that underlie the work, but linking them to business results is an issue (Allee 2009, p.238). In addition the new value creation approaches set considerable pressure on technology management practices, as ICT is seen the enabler of these models (Pekkola & Munkvold 2008, p.202; Zott et al. 2011a, p.7). Thus, technological infrastructure, business operations, and business models need to be analyzed parallel rather than separately (Pekkola & Munkvold 2008).

2.3. Emerging smartness in business networks

Viewing value creation from network perspective is not an easy task. At the same time one should understand the dynamics of the business world, including business processes, market dynamics, as well as management issues, and the constant changes in technologies that reveal new opportunities for enhancing the current way of doing business (Vervest et al. 2005, p.68). One concept for catching the network approach from business and technology perspectives, and furthermore emphasizing the full consortium of them, is Smart Business Networks (SBN) (see e.g. Vervest et al. 2005; Vervest et al. 2008; Vervest, van Liere & Zheng 2009). The concept catches important aspects from several fields, including business management, supply change management and information sciences, to capture the paradigm changes in value creation and business practices (Vervest, van Liere & Zheng 2009, pp.4–5). It is not a business model or a value creation model *per se*; rather it resembles the current environment where organizations conduct business, and helps to understand challenges and opportunities available.

The term consists of three words which are equally necessary to capture the whole essence of change: ‘Smart’ includes the novel and innovative aspects; ‘Business’ links the term strongly to business environments and practices of doing business (Vervest, Preiss, et al. 2004, p.229)*;* and ‘Network’ relates to a structure where a number of nodes are connected and related to each other by specific thread (Håkansson & Ford 2002, p.133). Together they form a concept which can be described as a *“group of participating businesses […] linked together via […] communication networks with compatible goals […]”*(Vervest, Preiss, et al. 2004, p.229). Network perspective of the definition names businesses (i.e. organizational entities or ‘actors’) as nodes of the network, and the threads linking the nodes to communication channels.

In this thesis we rely on the above definition of SBNs, but would like to address additional considerations on the definition of nodes in the concept. Instead of rather vaguely defining the network participants or network nodes as 'business entities' and 'actors'(Vervest, Preiss, et al. 2004, p.229), we emphasize that they are actually different roles played by the network participants (Allee 2008, p.14), and thus the business entities are actors which can be individuals, teams, business units, whole organizations, or wider collectives such as communities, business webs or industry groups (Allee 2008, p.14; Biem & Caswell 2008, p.4). This also affects the threads in the networks: Instead of linking the actors with communication networks (Vervest, Preiss, et al. 2004, p.229) the role perspective views the threads as interactions (see e.g. Allee 2008). Interaction view does not exclude the original notion of communication networks as links between the nodes, but rather looks it from another perspective; interaction often describes transactions of deliverables that shift between the actors (Allee 2002, pp.8–9; Preiss 2005, p.91) through communication networks or other technologies (Dunn & Golden 2008, p.36). In this sense, the technologies are the enablers of SBNs (Dunn & Golden 2008, p.36; Vervest & Zheng 2009, p.4). The above specifications let us distinguish the different objectives of each actor as well as their activities, and understand the collaborative interactions that they make in Smart Business Networks.

As we can see from the previous chapter, the idea of business networks is not a novel one – It is the 'smartness' of the network that makes the novelty of the term (see e.g. Dunn 2005, pp.145–149). Van Heck and Vervest (2007) studied companies like Amazon and eBay to discover how traditional business networking was turned into smart business networking. In the process they also distinguished key differences on characteristics of traditional business networks and SBNs on five different level: products and services, value creation, coordination and control, information sharing, and infrastructure (see table 2.2).

Table 2.2. *The key differences between traditional and smart business networks (adapted from van Heck & Vervest 2007, p.30)*

	Traditional Business Network	**Smart Business Network**
Products and Services	Relative simple, unbundled, and slowly delivered products and services	Relative complex, bundled, and fast delivered products and services
Value Creation	Supply chains with long term connected relationships	Demand networks with quick connect and disconnect relationships

Coordination and Control	Hierarchical and central control and decision making	Network orchestration with distributed control and decision making
Information Sharing	Information sharing with direct business partners	Information sharing over and with network partners
Infrastructure	Actor platforms with information silos and systems	Network platform with networked business operating system

The differences outline the transformation from traditional business networks to Smart Business Networks but for deeper enlightenment we have to dig deeper to the characteristics of SBNs. The table also may lead us astray from the fact that actually achieving the state of Smart Business Networks requires considerable work; to meet the characteristics and capabilities of SBNs companies have to address modifications to business logics and strategies, technical infrastructures as well as management practices, and yet only a minority of companies can call themselves rightfully a SBN player (Dunn 2005, p.145). After all, a significant interest towards SBNs, both in academic and business worlds, has emerged recently as it can be seen from the productions of Smart Business Network Initiative (SBNi) between 2005 and 2009 (see Vervest et al. 2005; Vervest et al. 2008; Vervest, van Liere & Zheng 2009). The following chapter reveals the different characteristics of SBNs and explains how they form the 'smartness' of the business network, which outlines the 21st century value creation.

2.3.1. Characteristics of Smart Business Networks

'Smartness' seems to be the key attribute in the transformation from traditional business networks into smart business networks (Dunn 2005, pp.145–149; Meuer 2009, p.213). One word, however, is insufficient to give us a holistic view of the characteristics of SBNs; smart or smartness can mean various things in different contexts. Vervest et al. (2004, p.229) apply the word 'smart' to an innovative, different or novel action. It has a connotation with fashionable and distinguished but may also be somewhat short-lived (van Heck & Vervest 2007, p.32) – What is considered smart today, may be considered to be "run-of-the-mill" tomorrow (Preiss 2005, pp.91–92). Yet 'smart' is also subjective and comparative; actors perceive it differently (Dunn 2005, p.149) and take actions according to their perceptions. Therefore the 'smart' in smart business networks is not an absolute but a relative term bound in different situations. It is a property through which a network can apply intelligence (Dunn 2005, p.149) and generate better-than-usual results leading to better performance than other forms of business arrangements (Vervest, Preiss, et al. 2004, p.229; van Heck & Vervest 2007, p.32; Vervest, van Liere & Dunn 2009, pp.26–27).

In order to benefit from the 'smartness', businesses first have to locate it and understand where to embed it (Preiss 2005, p.101). The question may not be as straightforward as it seems considering the vague nature of being smart. Nagel et al. (2005, p.128) argue that businesses have to look smart through the products, services and experiences they offer. Other authors also agree that smartness lies in the business models (Dunn & Golden 2008, p.37); in network activities such as coordinating, collaborating, innovating and organizing; in information and knowledge management practices (Nagel et al. 2005, p.128); in technologies and information systems (Heikkilä et al. 2005, p.401; van Heck & Vervest 2007, p.29); or in general in the behavior of the organizations (Vervest, van Liere & Dunn 2009, p.26). It is also said to emerge with amplification of the participants' capabilities (Dunn 2005, p.149). In addition, some researchers also discuss that smartness cannot be formed in isolation (Dunn 2005, p.149) and it extends from a core organization to a wider range of participants (ibid, p. 156). Therefore smartness is distributed across the whole network (Vervest, van Liere & Dunn 2009, p.26); smart sub-systems of the network overlay and display the smartness of the main SBN (Shaw et al. 2005, pp.301–302). Thus the key idea of being smart is connected to the ability to capture a valuable position in the network, and to leverage that position across as many links as possible (van Heck & Vervest 2007, p.30). Through that position businesses are able to deliver new value through their capabilities and access the capabilities of other companies (Vervest, van Liere & Dunn 2009, pp.18–20).

Summarizing the literature, it can be said that smartness is embedded in the structures and behavior of individual actors, as well as the dynamic interaction of different actors in smart business networks. Thus characteristics of smartness illustrate the overall characteristics of smart business networks. The characteristics of SBNs can be divided into four categories: business logic, network structure and design, knowledge management and learning, and ICT infrastructure and information systems. Table 2.3 describes the previously mentioned categories and the key characteristics of SBNs.

Table 2.3. *Characteristics of smart business networks with references to literature*

Characteristics of SBNs:	**Reference:**
Business Logic	
Agility	(van Oosterhout et al. 2008; Goldman et al. 2009)
Plug-and-play –Capability / Quick Connect and Disconnect	(Konsynski & Tiwana 2005; van Heck & Vervest 2007; Xiao & Zheng 2008; Koppius & van de Laak 2009)
Collaboration	(van Holland et al. 2005; Konsynski & Tiwana 2005; Nagel et al. 2005; Werthner et al. 2008)

Modularity and flexibility	(Konsynski & Tiwana 2005; Muller & Schipper 2005; Wolters et al. 2005; van Heck & Vervest 2007; Vesa 2008; Meuer 2009)
Customer centric	(Li et al. 2008; Vervest, van Liere & Dunn 2009)
Network Identity	(Janneck et al. 2008)
Shared value	(Nagel et al. 2005; Janneck et al. 2008; Goldman et al. 2009; Shaw 2009; Vervest, van Liere & Dunn 2009)
Network structure and design	
Synergy effect	(Janneck et al. 2008; Goldman et al. 2009; Eschenbaecher et al. 2005; Shaw 2009)
Heterogeneity of actors	(Konsynski & Tiwana 2005)
Complex coordination	(van Heck & Vervest 2007; Heikkilä et al. 2008, p.412; Rittgen 2008, p.322)
Network orchestration	(Koppius & van Heck 2005; Busquets 2008; van Oosterhout et al. 2008, pp.171–173; Shaw 2009, p.319)
Electronic intermediaries (EIM)	(Basu & Muylle 2008)
Knowledge management and learning	
Adaptability and proactiveness	(Eschenbaecher et al. 2005, pp.309–310; Konsynski & Tiwana 2005; Janneck et al. 2008; Busquets et al. 2009)
Enhanced learning	(Riis 2009; Saxena 2009, p.73)
Flexible transfer of capabilities, resources and information	(van Liere et al. 2005; Nagel et al. 2005; Lyman et al. 2009; Pyke 2009)
Openness	(Konsynski & Tiwana 2005; Vervest, van Liere & Dunn 2009, p.25)
Enhanced Innovation and exploration	(Konsynski & Tiwana 2005; Nagel et al. 2005; Busquets 2010)
Distributed innovation	(Eschenbaecher et al. 2005; Heikkilä et al. 2008)
ICT infrastructure and information systems	
Self-organizing	(Dunn 2005; Konsynski & Tiwana 2005; Bray & Konsynski 2009)
Awareness and availability	(Dunn 2005, p.155)

Flexible integration and separation of systems	(Xiao & Zheng 2008)
Integrated interfaces	(Meuer 2009; Pyke 2009)

Business Logic

Smartness can be embedded in the business logic of the network. SBN concept proposes that all players in the network have shared business logic which allows different actors to act individually according the joint rules of the network (van Heck & Vervest 2007, p.36). Increasingly this leads to specialization of expertise in one firm and reliance of partner organizations, and their capabilities, for creating value (i.e. collaboration) (Konsynski & Tiwana 2005, pp.79–80; Saxena 2009, p.69). Keeping in mind the recent developments towards networked and collaborative value creation practices, this kind of shared smartness is required in order to survive in markets and achieve modern business competitiveness (Vervest, Preiss, et al. 2004, p.229).

The shared business logic incorporates certain business agility, plug-and-play capabilities, and modularity, as it was stated in the table above. Business agility is the ability of a firm to sense highly uncertain external and internal circumstances, and responding to these circumstances, either reactively or proactively, by leveraging the capabilities of partners in the network. Achieving this, active engagement of proper learning activities together with exploration and exploitation with customers, are required (see also 'Knowledge management and learning' below). (van Oosterhout et al. 2008, p.161.) Responding to a change is clearly in focal point of business agility. Reactive responding implies responding to a change in the network in order to retain competitiveness, and proactive responding refers to the initiating position of the change. (ibid, p.160.) Flexible adaptation to change requires dynamic and modular business processes, and processes that mirror the strategic capabilities of a company (Saxena 2009, pp.72–73)

Oosterhout et al. (2008, p.160) argue that agility demands a change in organization and network structures; change can happen either in the existing structure or towards a new structure. This suggests great flexibility and modularity of business processes and products, as well as quick connect and disconnect capabilities. Plug-and-play (or connect and disconnect) capabilities enable quickly connecting and disconnecting with network actors by selecting and executing business processes, or parts of processes (Muller & Schipper 2005, p.226), across the network (Vervest, Preiss, et al. 2004, p.230; van Heck & Vervest 2007, pp.33–34). It is important to notice that modular and plug-and-play capabilities do not stand only for manufacturing businesses but for service-oriented companies as well (see e.g. Muller & Schipper 2005). Moreover, linking of organizations and collaboration between multidisciplinary project groups can

be either ad-hoc (i.e. based on individual transactions) or more longer term partnerships (van Holland et al. 2005, p.53; Konsynski & Tiwana 2005, p.75; Dunn & Golden 2008, p.36).

Which actors, or capabilities, to choose depends on the actor's network identity. Network identity is often used synonymously with organizational culture, and refers to company's reputation, perceived reliability, ethics, values, management philosophies, policies, relationships, and many other factors (Janneck et al. 2008, p.514). Thus identity is something an actor purposefully shows to other members in the network (i.e. *branding*) but also represents compatibility or fit when an actor has an opportunity to join an SBN or when SBN chooses to invite an actor to join it. This is why network identity plays an important role in enhancing, and even making possible, the collaboration in the network. (ibid, p. 515-516.)

Shared business logic leads to shared value; value is the characteristic signifying the perceived benefits between network members (Janneck et al. 2008, p.517). Fundamentally access to capabilities of other companies is one key benefit of being part of a network (Vervest, van Liere & Dunn 2009, p.20; Shaw 2009, p.311). Thus, the company can focus on its core concepts and seek complementary resources that collectively are required to deliver the result (e.g. fulfilling of customer need) (Vervest, van Liere & Dunn 2009, p.20). More increasingly the smart networked approach also enables integration of communities and individuals, together with traditional business actors and partners, into the value creation process, which may generate 'value surprises' in terms of access to knowledge you do not know or unanticipated outcomes of the integration (Goldman et al. 2009, pp.51–52). Even though different actors have specific agendas and motives for their actions in the network, shared value also incorporates wellbeing of the whole system.

Network Structure and Design

Second set of characteristics are related to the design and structure of the network. Here structure refers to the actual physical form of organizing (i.e. network as nodes and threads) and network's attributes as a whole. Design refers more to purposeful activities and management action for controlling and managing the network structure (i.e. network orchestration and coordination).

First two characteristics, synergy effect and heterogeneity of actors (see table 2.3) are attributes linked with network structure. Synergy effect refers to a capability that a network possesses, which no single member of the network can provide themselves (Janneck et al. 2008, p.512). This is quite evident if we consider the characteristics in business logic layer; SBN's temporary, flexible and dynamic nature requires the necessity to quickly exploit synergies between different enterprises to realize common

business objectives (Eschenbaecher et al. 2005, p.307). Another straightforward attribute of the whole network is heterogeneity (i.e. the network consists of multiple members with different core capabilities). Heterogeneity is important for flexibility, and retention of heterogeneity broadens the locus of search for potential yet-to-occur opportunities that remain elusive (Konsynski & Tiwana 2005, p.79). The dynamic nature of SBNs (i.e. constant alignment with change) requires constant assessing of network members in order to retain the best fit of members in the network, and identifying novel opportunities.

However, network as a structure, and modular designs on processes and products require much more coordination than traditional (non-modular) designs. This is due the increased number of actors and components involved, and increased need in understanding the modular processes and compatibility (Vervest, Preiss, et al. 2004, p.231; van Heck & Vervest 2007, p.34; Rittgen 2008, p.322). Network orchestrating and electronic intermediaries have gained much attention in SBN literature (see e.g. Eschenbaecher et al. 2005; Koppius & van Heck 2005; Basu & Muylle 2008; Kartseva et al. 2008; van Oosterhout et al. 2008; Shaw 2009). Network orchestration is about coordinating the transitions between different actors in the network; it is not micro-managing of transactions within companies but rather it ensures the handover of outputs and flows of inputs (e.g. information, resources etc.) work seamlessly (Vervest et al. 2008, p.303). Electronic intermediaries (EIM) are organizations purposefully designed to play the orchestrator's part in the network, and they are becoming a common and valuable part in SBNs (Basu & Muylle 2008, p.78). EIMs services include transaction (e.g. payment, logistics, and search), decision support (e.g. obtaining information and using analytical models), and integration (e.g. data and application integration) services (ibid, p. 81-83). Ebay and Amazon are examples of well-known electronic intermediaries.

In practice, network orchestrator uses the network to understand the values of the customers and contrasts these with the potential contributions and values of current and potential actors in the network (Shaw 2009, p.319) Thus the governance of SBNs is not cooperation-based, rather it is based on finding an equilibrium in the conflicting goals of individual actors in the network (Vervest, van Liere & Dunn 2009, p.28). The orchestrator has an overview of all the resources and capabilities in the network members, as well as end-customer demands, and a plan for optimal resource utilization to meet the customer needs (Li et al. 2008, p.450). Smartness of the network reflects from these governance activities, which are required to make the SBN sustainable, and prevent and detect opportunistic behavior of its participants (Kartseva et al. 2008, p.336), as well as execute the previously mentioned business logic.

Knowledge Management and Learning

As we already know, the business logic of an SBN reflects increased agility through modular and flexible processes and collaboration. Moreover the network can be seen as a combination of different resources, capabilities and activities (van Liere et al. 2005, pp.260–261), and governing them to satisfy customer needs through optimal utilization of resources is in focal point of SBNs (Li et al. 2008, p.450). We understand that these previously mentioned aspects are tightly linked with knowledge management and learning activities of the network and its actors. Table 2.3. suggests six important and interrelated characteristics under the above mentioned category, that reflect smartness in networks: adaptability and proactiveness, enhanced learning, flexible transfer of capabilities, resources and information, openness, enhanced innovation and exploration, and distributed innovation.

Adaptability and proactiveness are central features of smart business networks (Eschenbaecher et al. 2005, p.310; Busquets et al. 2009, p.287). Adaptability is the ability of an actor to consciously or unconsciously change to fit different circumstances (Busquets et al. 2009, pp.287–288). Responding to change can either happen passively (i.e. accepting the change as it is) or actively (i.e. proactive attempts to influence the change) (van Oosterhout et al. 2008, p.160; Busquets et al. 2009, p.288). From these two, proactive approach is seen more favorable in SBNs even though both aspects are important for remaining competitive in dynamic environments by reorganizing and refocusing resources (Janneck et al. 2008, p.516).

Adaptation is also important part of company's learning activities; instead of trusting assimilation (i.e. adaptation based on existing portfolio of possible actions) companies can accommodate (i.e. changing mental models and setting new behavior to find an appropriate result to a situation), which requires acquiring of new knowledge and skills through learning activities (Busquets et al. 2009, p.288). Learning is also in focal point of achieving the previously mentioned business agility (van Oosterhout et al. 2008, p.161). Saxena (2009, pp.72–74) outlines that SBN's business agility springs from the 'smart' management of business processes through real-time (i.e. at the time of discovery) dynamic adaptation and continuous experiential learning. Riis (2009, p.357), in turn, argues that the whole interplay of different network actors is a result of collective learning process whether it is intended or not (cf. reactive and proactive adaptation).

The last four characteristics under this category describe attributes and features which contribute in creating adaptability and enhanced learning. The core of SBN is the combination of different resources, capabilities and activities (van Liere et al. 2005, pp.260–261) transferring and transforming between the actors (Nagel et al. 2005, p.130; Lyman et al. 2009). Openness is a keyword for achieving this transfer. Vervest et al.

(2009, p.26) suggest that Smart Business Networks exhibit multiple forms of openness, such as capability openness and process openness. Capability openness refers to resources and capabilities made available for network participants; process openness enables the collaborative operations (e.g. synchronized actions for delivering results) (ibid, p. 25). Thus, openness can be seen as a part of implementing the business logic.

Since adaptation and learning require constant adjusting to changing environment and development of processes and products, innovations and exploring new opportunities are also key elements in embedding smartness (Konsynski & Tiwana 2005, p.75; Vervest et al. 2005, p.43; Heikkilä et al. 2008, p.412). Busquets (2010, pp.481–483) argues that innovation and exploring new opportunities are the keys to future value creation and a required activity to guarantee organizational long-term survival. Increasingly these innovation activities in smart business networks are turning in collaborative and distributed activities; if processes are modular and involve multiple actors in execution developing these processes requires multiple actors beyond organizational boundaries (Heikkilä et al. 2008, p.412). Distributed innovation can be defined as the process of managing innovation within and across different network actors joined to co-design and co-produce products and services to fulfill the customer needs (Eschenbaecher et al. 2005, p.311).

ICT Infrastructure and Information Systems

At this point it is already clear that many of the above mentioned characteristics, and today's turbulent business environment, require high level of IT agility (van Oosterhout et al. 2008, p.175). It was also mentioned earlier that technology is the main enabler of SBNs; enterprise level solutions and information systems reflect the business logic of the SBNs, and wide variety of intelligent, web-based infrastructure and tools are supporting the activities in the network (Vervest et al. 2005, p.44). Cooperation and collaboration between business network partners is enabled by certain automation tools that allow the capture, enactment and sharing of business processes (Dunn 2005, p.157). Nagel et al. (2005, p.128) also argue that technologically enhanced SBNs enable the development of new or altered strategic advantages, and creation of new value across and between traditional businesses, that were not found in traditional business networks. Thus it is relevant to examine some characteristics related to information and communication technologies as well as applications that reflect smartness in SBNs.

As stated in table 2.3 technological solutions and ICT infrastructure in SBNs seem to have some general characteristics that enable the activities, collaboration (as well as other characteristics) and business logic across organizations. These characteristics are: self-organizing (Dunn 2005, p.155; Bray & Konsynski 2009, p.84), awareness and availability (Dunn 2005, p.155), flexible integration and separation of systems (Vervest et al. 2005, p.44; Xiao & Zheng 2008, p.109), and integrated interfaces (Pyke 2009,

p.48). Self-organizing refers to organism's ability to know itself in relation with other organisms, communicate and interact with others. Here, in ICT context this increasingly links to the content of SBNs which should be self-organizing. (Bray & Konsynski 2009, p.89). It is clear that recent technological innovations (e.g. Internet and enterprise information systems) have increased the amount of information. However, more information does not always make for better decisions, and yet humans have finite memories and information processing capabilities, which makes handling this information difficult even with IS solutions. Thus, the self-organizing ability strives to replace existing information with 'better' information. (ibid, p. 91-92.) This means that content (i.e. information) together with suitable technological solutions and applications (independent of human activity) need to know what it is in relation to other elements and improve itself (Bray & Konsynski 2009, pp.89–91). Awareness and constant availability are characteristics strongly linked with ability to self-organize. Awareness refers to system's ability to sense the changes in content due the activities different actors make; and availability allows the systems to be accessible whenever needed (temporarily vs. long term) (Dunn 2005, p.155).

Quickly connecting and disconnecting different actors in relation to specific business processes in networks is one key feature of SBNs and its business logic. Thus the technological solutions have to support this same ability. (Vervest et al. 2005, p.44; Heikkilä et al. 2005, p.399; Xiao & Zheng 2008, p.109.) To achieve this, different actors need to be compatible with one another (e.g. standardization of information, processes and communication) (Koppius & van de Laak 2009, pp.269–270). Abstraction standardization on business processes and IS components reduces also the need to understand the full complexity of business operations between different actors (Shaw et al. 2005, p.302). This kind of ideology is present in Business Operation Platform perspective (see e.g. Pyke 2009) where integrated interfaces are used to manage the communication and use of business processes in collaborative activities to enable plug-and-play ability (Koppius & van de Laak 2009, pp.270–271).

Concluding this chapter we would like to underline how interconnected the characteristics or the whole concept of SBN is. Achieving one feature may require modifications in several other characteristics – Embedding smartness in business logic (on strategic, tactic or operative level), for example in form of agility, requires development in business processes, IT infrastructure, and modifications in knowledge management practices as well as reorganizing the structures of the network. Still, the core concepts of conducting business, such as business models and processes (Sanz et al. 2006; Saxena 2009, p.72), are the driving factors towards finding the right equilibrium in the conflicting goals of individual actors in the network (Vervest, van Liere & Dunn 2009, p.28), and satisfying the changing needs of the markets – or more precisely, providing superior value to the customer (Saxena 2009, p.72).

2.3.2. Current issues and visions of smart business networks

Currently we are in a transition towards digital service economy (Lehti et al. 2012, p.6) where everything that can will digitalize. It is an era where consumers become producers and vice versa; an era where production and delivery channels of digital products and services are partly the same: the global cyber networks. Currently the digital technologies are in a stage where they affect every industry, organizations, institutions, societies and their structures, human behavior, and the ways how people think. (ibid. p.6-10.) The change about to commence can be compared to Industrial Revolution that happened 200 years ago. The effects during the ongoing technology revolution are, however, more drastic: First time in human history the changes are global and affect countries all over the world simultaneously. Also the size and velocity of change is much greater, and possibilities and potential benefits are applicable to companies, organizations as well as ordinary people. (Evans & Annunziata 2012, p.5; Lehti et al. 2012, pp.6–10.)

"*Smart business networks develop not only because technology permits them to develop, but more significantly because markets and modern business competitiveness require such networks in order to survive and thrive*" (Vervest, Preiss, et al. 2004, p.229). However, we have to remember that only a minority of companies can call themselves rightfully a SBN player (Dunn 2005, p.145) or an actor truly utilizing the aforementioned characteristics of SBNs. SBNs cannot be enabled in isolation from the dynamics of different network members and traditionally organizations exhibit great difficulties in absorbing substantive and continual change. There is also the digital dilemma: the conflict between "*traditional organizing the way we were and are – and acting in the 'smart digital world' – the way we could, or must, be*". In reality many companies are trapped in disparate technology solutions from powerful ICT suppliers leading to partly optimal compromise between companies' legacy systems and an uncertain instinct for the future ICT. (Dunn 2005, p.150.) For example, Saxena (2009, p.76) argues that existing and commercially available BPMS and ERP systems relate only the business functionalities but not the capabilities to specific functionalities. This does not support the building of appropriate processes for company specific capabilities, which is in the core of SBNs.

The second important challenge is to see the world wider than just a snapshot of what we are now. Technologies are developing and novel concepts are emerging all the time, as we saw from the hype cycle perspectives in introduction (see chapter 1). Fast forwarding ten to fifteen years from now, the world will presumably look quite different. Lehti et al. (2012) argue that in the near future most, if not all, products and services will get their partial or full digital substitutes. They also see that the upsurge of knowledge intensive services will gain increased focus through automation of knowledge intensive work and emergence of totally new digital services. This

development will require both implementation of novel technology and also changes or reorganizations in work itself. (ibid. p. 92-93.)

Evans and Annunziata (2012, pp.8–12) argue of the rise of Industrial Internet, which relates to the integration of complex machinery with sensors and intelligent software into a network system. Industrial Internet can be thought as a flow and interaction of data: The data is harvested from intelligent devices and networks; stored, visualized, and analyzed with big data and analytic tools; and used adjust firm operation or in decision making situations. The authors argue that applications of such concept are immense in various industries (see Evans & Annunziata 2012). Also Lehti et al. (2012, p.96) emphasize that intelligence and the amount of digital parts and control units are increasing in physical products – basically any machine or device can be turned into a terminal with linkage to the Internet. This leads to an increased amount of information which simply cannot be filtered, organized and sorted with human participation (Bray & Konsynski 2009, p.89).

Goldman et al. (2009, pp.49–51) depict a shift from first generation business agility to next generation agility, where value propositions and the constitution of the network itself is no longer established in advance but dynamically on-the-go. This, yet again, changes the whole business logic. In this organizational and technical context, Werthner et al. (2008, p.187) suggest future networks to be even more dynamic and specific nodes more autonomous. They see business logics enabling users and customers in selecting and dynamically bundling products and services, as well as increased trust and openness between network actors. Moreover, people will gain increased accessibility as well as availability everywhere and any time through fixed and mobile communication. (ibid.)

These futuristic speculations agreeably do not forecast future accurately but they may establish some scientific value as a thought piece by widening the perspectives on viewing the world. Still several authors (Evans & Annunziata 2012; Lehti et al. 2012; Pajarinen et al. 2012) agree that under these circumstances the change is evident and already happening. The evidence include for example the quick rise of the Internet and social media, and how they have become essential part of everyday life and user behavior (Lehti et al. 2012, p.42). Moreover, companies have applied Internet based technology to industrial applications as they have become available over the last decade (Evans & Annunziata 2012, p.9). Globalization and digitization together have also distributed value creation especially in traditional machinery industries: Value is no longer created and captured during the manufacturing process in one specific location, but different manufacturing and value chain functions have been distributed globally in different locations (Pajarinen et al. 2012).

After exploring how value creation has changed over time according to economic changes and distinguishing the key differences between traditional and networked ways

of creating value, we can move on to discuss the different frameworks designed to analyze and understand value creation models in networked environments.

2.4. Value creation frameworks for business networks

Kothandaraman and Wilson (2001, p.384) created a model of value-creating networks, which acknowledges the change in the locus of value creation expanding through the boundaries of the firm and industries (Amit & Zott 2001), and challenges the suitability and sufficiency of prior value creation models (see also Amit & Zott 2001; Zott et al. 2011a). The model works around three interrelated core concepts – core capabilities, relationships, and superior customer value (see figure 2.1). Core capabilities are the processes and technologies a firm possesses; relationships illustrate the connection of different actors in the business network; and superior customer value is the ultimate fulfillment of a customer need by delivering products and services. (Kothandaraman & Wilson 2001, pp.380–384.)

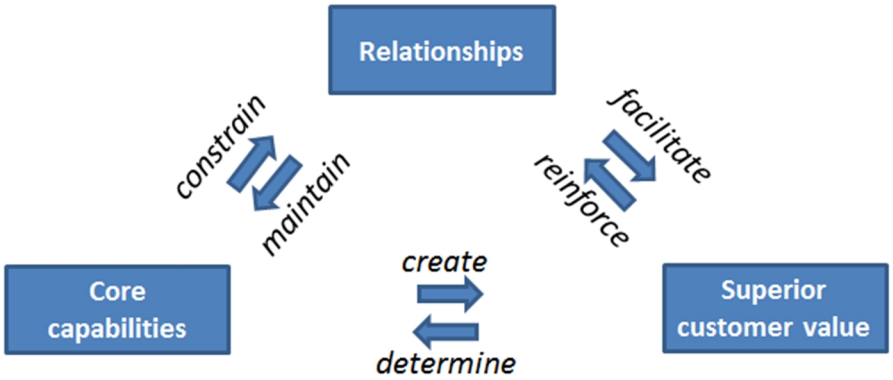

Figure 2.1. *A model of value-creating networks (adapted from Kothandaraman & Wilson 2001, p.384)*

As we can see from the above picture, the three concepts are interrelated and equally important for modeling the value creation in networks. Kothandaraman and Wilson (2001, p.384) present the model as a reciprocal process started by an objective to create superior customer value. This value is actually created by combining not only firm's own resources but also utilizing other members' resources. The relationships are seen as the facilitator of value creation; the better the quality of the relationships are and the more unique the mix of resources is in the network, the more enhanced or improved the core capabilities will be. Thus, the capabilities constrain the network relationships (i.e. network members only value the firm's capabilities according to the customer needs), and at the same time relationships are needed to maintain the network and facilitate the customer value. When customers appreciate the value delivered by the network, it boosts the morale of network members and reinforces the quality of relationships. (ibid.)

Kothandaraman's and Wilson's (2001) model effectively illustrates how the value creation and its dynamics work around in network environments by outlining the most important facets: resources and capabilities, customer needs and network dynamics. The model also suggests that achieving competitive advantage requires considerable work with other member businesses in the network. The locus of competition has changed from competing against specific firms into competing networks, where multiple companies compete with co-created capabilities against other value systems (see e.g. Kothandaraman & Wilson 2001; Vervest, Preiss, et al. 2004; Vervest & Zheng 2009).

However, compared to other models (see e.g. Gordijn et al. 2000; Allee 2002; Weigand et al. 2007; Biem & Caswell 2008; Vargo et al. 2008; Håkansson et al. 2009) available in the current literature, the model does not provide tools for generating deeper insights or classifications of resources and capabilities; knowledge for understanding the exchange mechanisms of value in the value system, descriptive or prescriptive frames for analysis, or strategic approaches for managing purposes, which often are beneficial from business perspective. Previously discussed SBNs also propose analyzing value creation through the dynamics between individual and collective participants, which are also recognized as key enablers for the whole concept (Dunn 2005, p.153). Moreover, the scope of this study suggests analyzing value creation from the network perspective without forgetting the interactions between different actors and their characteristics and capabilities.

This led us to assess different existing value creation frameworks through some selected elements that are important for distinguishing the characteristics and dynamics of novel value creation models, and for fulfilling the purpose of this study. These elements include actors and their relationships, resources and capabilities, transactions and exchange mechanisms. Here transactions are viewed as unidirectional transfers of resources and capabilities from one actor to another, and exchange mechanisms describe bi-directional transactions (first transaction triggers a response from the recipient) (see e.g. Allee 2002; Biem & Caswell 2008).

In addition, we measured the framework's ability to visualize value creation (e.g. transaction dynamics between actors) with concrete methods, such as value maps or other mapping tools. Also, we took into consideration the descriptive or strategic nature of the framework; descriptive analysis illustrates the 'as-is' state of the value model, whereas strategic scope holds some portion of analysis in future actions (e.g. a strategic abstraction level or normative guidelines for future actions). The different scopes are not mutually exclusive – a framework can for example first create an 'as-is' description of the situation with strong visualization tools and then focus on adjusting the model with strategic actions.

Assessment of different value creation frameworks through the above mentioned elements and scope is presented in table 2.4 below. We used plus marks ('+') to indicate the framework's strength in describing each element or scope of the analysis; one plus mark indicates relatively little contribution towards that element, three pluses indicate strong linkage between the assessed element and the framework, and two pluses falls somewhere between the previous two. Results of the assessment are shown in chronological order (as they appeared in the literature) from oldest to newest.

Table 2.4. *Value creation models for networked environments*

Framework	**Elements**				**Scope**		
	Actor & actor relationship	Resources & capabilities	Transactions	Exchange mechanisms	Visualization	Descriptive	Strategic
ARA-Model (Håkansson & Snehota 1995)	++	++	++	+	+	+++	++
Value configuration models (Stabell & Fjeldstad 1998)	+	+	+	+	+	++	++
The e3-value network (Gordijn et al. 2000)	++	++	+++	+	+++	+++	+
Sources of value creation in e-business (Amit & Zott 2001)	++	++	++	++	+	++	+++
A model of value-creating networks (Kothandaraman & Wilson 2001)	++	++	++	+	+	++	++
A value network approach for modeling and measuring intangibles (Allee 2002)	++	+++	+++	+++	+++	+++	++
The c3-value approach (Weigand et al. 2007)	++	+++	+++	++	+++	+++	++
A value network model for strategic analysis (Biem & Caswell 2008)	+++	+++	+++	+++	+++	+++	++
Value co-creation among service systems (Vargo et al. 2008)	++	++	++	++	+	++	+
Locus/Creator/Scarcity -Lens (Briggs 2009)	+	+	+	+	+	++	+

ARA-Model (Håkansson & Snehota 1995, p.44) – Activity-Resource-Actor model – focuses on network relationships between actors. It can be used as a conceptual framework to analyze the effects of change in a relationship and to identify factors affecting the development of a relationship (ibid.). The framework suggests a three layered perspective (i.e. activity, resource and actor) for describing the outcomes of an interaction process (i.e. activity links, resource ties and actor bonds) (Håkansson et al. 2009, p.33). Model effectively includes analysis of actors and resources between dyadic relationships, but fails to effectively model relationships and activities between multiple actors at the same time. Håkansson and Snehota (1995, p.45) also argue that the value of the model only lies in explorative point of view as it only identifies where effects might occur. Thus the model is more descriptive with weak visualization capabilities, than strategic.

Value configuration models (Stabell & Fjeldstad 1998) include analysis of value creation models of chains, shops and networks. Framework comes close to actual business models: chains resemble strongly Porter's value chain analysis (see e.g. Porter 1996) and linkages between supply chain partners; shops model a dyadic business problem solving situation between a customer and a consulting company; and networks describe effective value creation model for a company offering mediating services (e.g. phone operators) (Stabell & Fjeldstad 1998). Strong linkages with business models make the frame more strategic than descriptive. However, the framework lacks the ability to effectively describe transactions or exchange mechanisms of resources and capabilities, as it only focuses on dyadic relationships. Network model identifies the networks ability to create and deliver value (Stabell & Fjeldstad 1998, p.427) but views this too strongly from mediator point of view.

The e3-value network (Gordijn et al. 2000) adds value network perspective in eBusiness environments by focusing on value creation abilities in eBusiness models. The framework visualizes actors, value activities, value ports, value interfaces and value objects, and their dynamics, with an UML-like modeling language (ibid., p.43-44). Thus the model manages to describe effectively the transactions between network actors, and proposes a rather complicated but effective visualization mechanisms as well. However, Weigand et al. (2007), and Biem and Caswell (2008) criticize that the model concentrates only to describe the 'as-is' state of the network and lacks the ability to plan the 'to-be' state (i.e. strategic aspects). The c3-value approach extends the strategic capabilities of e3-model by offering different modes (i.e. competitive, customer and capability resource modes) for analysis (Weigand et al. 2007) but still lacks the ability to capture effectively the exchange mechanisms of the whole network.

In their framework, Amit and Zott (2001) describe the four fundamental drivers for value creation in eBusiness, namely efficiency, complementarities, lock-in, and novelty

from business model perspective. Their work builds on well-known value creation theories – TCE, value chain, RBV and Schumpterian Innovation – and thus it recognizes the importance of resources and capabilities, the roles of different actors in value creation process and the exchange mechanisms for delivering value (ibid.). However, the model is rather conceptual and strategic than practical in nature; analysis requires in-depth knowledge about the value drivers and their interaction.

Allee's (see e.g. 2000; 2002) value network approach for modeling and measuring intangibles builds on an effective diagramming technique that considers participants, deliverables, transactions, and exchange mechanisms between network actors (Allee 2002, pp.6–9). The model also proposes a categorization for different deliverables (i.e. intangible vs. tangible) (Allee 2000, p.38), and holds different perspectives for analysis, including both descriptive and strategic aspects (Allee 2008). The model is criticized for not having a fundamental purpose for the whole network and exchanges in it due to assumptions of unmanageability of the network (i.e. network is a living system). This may limit the model's strategic capabilities from the perspective of a specific actor. (Biem & Caswell 2008.)

A value network model for strategic analysis (Biem & Caswell 2008) acknowledges business entities as the primary building blocks, and the end consumer in focal point of the network, guiding the value creation process. Business entities capture same kind of tripartite structure as in ARA-model: actor perspective includes business intent and will of the actor (thus actor here is quite different than in e3 and c3 models); capability perspective describes the set of activities, processes and dynamics that are specific to the business entity; and asset perspective describes the tangible and intangible resources of the business entity enabling the capabilities. The actual model builds around interaction between the business entities viewing transactions and exchange mechanisms through out-offerings (i.e. resources and capabilities transferred to another entity) and supplies (i.e. resources and capabilities received from other entities). Thus the actual value creation is captured in exchange mechanisms and transformation of supplies into out-offerings. Further analysis includes also the descriptive state of the network and prescriptive (i.e. strategic) analysis with step-by-step guidelines. (Biem & Caswell 2008.) In this way the framework fulfills quite effectively all the elements according to our analysis (see table 2.4). However, framework's strategic analysis tools do not include competitor analysis which is an essential part of prescriptive analysis.

Vargo's et al. (2008) value co-creation framework builds around service systems emphasizing resources as service-delivery vehicles and services as fundamental part of value exchange. Hence according to this view value is co-created through combined efforts of network actors in service system, and delivered to another service system through value propositions, acceptance and evaluation of value. The framework thus extends the traditional view of 'value-in-use' with 'value-in-context'. (Vargo et al.

2008, pp.148–150.) The framework activates important elements and manages to catch the change in the locus of value creation but fails to visualize them. Framework is also more conceptual and theoretical than managerial. Thus it can be argued that the model neither describes the current state nor provokes strategic analysis too effectively.

The last framework in table 2.4 – Locus/Creator/Scarcity -Lens (see Briggs 2009) – focuses on Web 2.0 business models and measures whether the value is created in a centralized or de-centralized manner. The lens considers the product as the locus of the value, creator perspective describes who or what is believed to be the agent of value creation, and scarcity perspective measures how much of the product is produced and re-produced (Briggs 2009, pp.40–42). The framework fails to effectively capture and visualize important elements. Firstly, viewing value only inheriting from the product, or in relations around the product, leads to limited analysis. Secondly, the lens does not recognize in-depth view over the value creator; only if value is created inside or outside company borders (or somewhere between them). Thirdly, the lens provides no tools for strategic analysis, and even the descriptive analysis stays rather shallow.

A short review on some well-known frameworks for value creation let us in conclusion that on model suits a specific situation better than others – Thus there is no absolute best among them. Moreover, a division between conceptual or strategic frameworks and more practical ones can be made. For example, value drivers (see Amit & Zott 2001) and service-system models (see Vargo et al. 2008) are strategic frameworks with value in conceptual and theoretical analysis, whereas value network models (see e.g. Allee 2002; Weigand et al. 2007; Biem & Caswell 2008) are more practical and their value comes with their ability to visualize and describe the current situation in relation with value creation, and with following managerial implications and strategic thinking. Importantly both perspectives are needed to create beneficial in-depth analysis on value creation in current business environments (Biem & Caswell 2008).

In relation to this research, the assessment of different value creation frameworks led us to identify important aspects which can be used to capture the real essence of value creation in recently emerged value creation approaches, and identify specific characteristics and their roles in value creation. More specific descriptions on using different frameworks can be found from the associated literature in table 2.4. In chapter 4 we discuss more about using some of these frameworks or some portions of them in relation to the cases in this research. Next chapter leads us to the second essential theme of our theoretic context – the recently emerged, social media and ICT based, value creation approaches.

3. NOVEL SOCIAL MEDIA AND ICT-BASED CONCEPTS

In the previous chapter we viewed how value creation has changed over time in parallel with economic and technological developments. It was argued that the development of global ICT infrastructure was playing an essential role during the transformation towards digital service economy (see e.g. Evans & Annunziata 2012, p.8; Lehti et al. 2012). Evans and Annunziata (2012) argue that since 1950s, after the emergence of main frame computers, ICT infrastructure and computing started spreading globally. This development is said to peak at the end of the 20th century when the Internet Revolution changed the world (ibid.,p.8); in the beginning of 21st century much of the ICT infrastructure is already in place and people are increasingly focusing on how to benefit from it (Lehti et al. 2012, p.20).

In this chapter we are going to view the world as it stands today from the perspective of recently emerged social media and ICT-based technologies and concepts that have established lasting impacts in doing business. First we will discuss all the concepts, technologies and tools on general level to obtain a holistic view over the topic. After that we will make a closer look on some of the selected concepts, namely crowdsourcing, swarm-work and gamification, and see what implications they have on value creation and more generally in conducting business. Finally, we also discuss the novelty of the selected concepts in relation with value creation activities.

3.1. A short review on emerged technologies and concepts

During the so called Internet Revolution development of ICT infrastructure and general trend towards digitalization started to change the rules for conducting business. New innovations, technologies and whole industries emerged causing radical changes to business operations (Lehti et al. 2012, pp.27–28). Quickly electronic commerce (eCommerce), or more accurately electronic business (eBusiness), became globally a major factor in determining the success of organizations (Holsapple & Singh 2000, p.151). The early definitions of electronic commerce emphasize the trading perspective (e.g. the buying and selling of goods and services electronically via computer networks) (Hayashi 1996, p.54). However, more recently the concept has gained a broader definition which acknowledges also the wide variety of other functions ICT potentially enables: "*Electronic business is an approach* for *achieving business goals in which*

technology for information exchange enables or facilitates execution of activities in and across value chains, as well as supporting decision making that underlies those activities" (Holsapple & Singh 2000, p.159).

Even though already over 10 years old, the aforementioned general definition is still valid. It does not try to enumerate technologies, business goals or activities in value chain as they are susceptible to change (Holsapple & Singh 2000, p.159). Even today the definition sends an important message that still outlines the current ways of doing business: *technologies enable and facilitate activities and business operations to achieve business goals.* Yet the context is a bit different: The sudden burst of dot-com bubble in the beginning of 21st century did not stop the Internet's technological development (O'Reilly 2007, p.17; Lehti et al. 2012, p.29). Currently, the evolution of Web 1.0 (i.e. the Internet) into Web 2.0 (see e.g. O'Reilly 2007; Yakovlev 2007) grounds the foundations for a myriad number of concepts, technologies, tools and software applications that can be applied in both consumer and business contexts.

As a concept Web 2.0 is vague, and no widely agreed-upon definition exists (Murugesan 2007, p.35). One definition describes Web 2.0 as an umbrella term describing the collection of interactive and user-controlled online applications expanding the experiences and knowledge of users as participants in social and business contexts (Constantinides & Fountain 2008, pp.231–232). Thus, it is not just a new upgraded version of the Internet but both a usage and a technology paradigm – a collection of technologies and social trends (Murugesan 2007, p.34). Core competencies of the concept include trusting users as co-developers; harnessing of collective intelligence; control over unique, hard-to-recreate data sources, that get richer as more people use them; and scalable digital services with flexible user interfaces not tied on any single device (O'Reilly 2007, pp.36–37). Moreover, Murugesan (2007, pp.34–35) argues that Web 2.0 facilitates collaborative content creation, enables the creation of new applications by reusing and combining data or applications from various sources, and establishes social networks or communities of people with common interests.

After saying this, it is easy to see the huge potential Web 2.0 may offer for businesses and organizations. Current literature holds no clear classification scheme for the whole concept (Web 2.0) or for the concepts, technologies or applications it enables. Thus the concept itself is loose, and merely encompasses several disparate technologies, concepts and their implementations (Backhouse 2009). Table 3.1 presents some examples of commonly known concepts and widely acknowledged Web 2.0 technologies and applications. The purpose of the table here is only to demonstrate the magnitude and significance of the concept and its descendants; proposing a full taxonomy for the topic, or describing each concept thoroughly, falls out of the scope of this study.

Table 3.1. *Examples of concepts enabled by Web 2.0 technologies, tools and applications*

Concepts:	**Web 2.0 technologies, tools and functions:**
• Social media • Enterprise 2.0 • Crowdsourcing • Collective Intelligence • Swarm Intelligence • Swarm-work • Gamification • Wisdom of Crowds • Open-source • Open Innovation	• RSS • Blogs • Mashups • Tags, tag clouds • Micro-blogs • Folksonomies • Wiki • Mobile technologies • Micro-payments • Micro-work • UGC (User Generated Content)
References: (Bonabeau & Meyer 2001; Surowiecki 2005; Chesbrough & Appleyard 2007; Brabham 2008; Bughin 2008; Bughin et al. 2008; Howe 2008; Brabham 2011; Deterding et al. 2011; Ruohisto 2013)	**References:** (Murugesan 2007; Backhouse 2009; Chui et al. 2009)

Some well-known implementations of the tools and concepts shown in the table may help in comprehending the core competencies and functions of Web 2.0: Websites such as Facebook, Wikipedia, YouTube, Twitter, Flickr, and del.icio.us are good examples of Web 2.0 implementations and their key functionalities (e.g. sharing content, sharing videos, social networking, micro-blogging, and labeling content) (Backhouse 2009). Different tools are designed to perform different things – for example, blogs are effective two-way communication tools; RSS feeds summarize and link to information sources; and Wikis represent collaborative authoring systems for creating and editing content (Murugesan 2007, p.35).

It is essential to understand that in reality the division between concepts and different technologies or tools is vague. For example, social media is often defined as *"a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of UGC."* (Kaplan & Haenlein 2010, p.61) Most of the concepts are overlapping by definition; hence there is no systematic way in which these different social media applications can be categorized. (Kaplan & Haenlein 2010, p.61.) Through this perspective the use paradigm of Web 2.0 gets emphasized: Ultimately the concept's technological solutions and tools are the evolutionary descendants of Web 1.0 (Yakovlev 2007), and they have been developed

due the perceived change in the manner of usage of the old Web (Kaplan & Haenlein 2010, pp.60–61; Backhouse 2009). Thus it is not only the technologies and tools that enable the concepts but also the changes in end-user behavior (i.e. the ideological level of Web 2.0).

Although many of the functionalities of different Web 2.0 tools and concepts can be easily perceived as end-user applications, Web 2.0 applications and concepts are becoming mainstream also in business contexts (Murugesan 2007, p.34). Several recent reports agree that businesses globally see the strategic value of Web 2.0 and plan to increase investments in them (ibid.). Positive trend reaches not only to B2C businesses but also more increasingly to many traditional industries (Lakkala 2011; Lehti et al. 2012, p.7).

Enterprise 2.0 is a concept bridging the gap between consumers and business regarding Web 2.0 utilization. McAfee (2006) argues that Enterprise 2.0 essentially refers to the utilization of social software (i.e. Web 2.0 technologies) within the company or between companies and their stakeholders. McAfee also sees that the various social tools are enabling effective knowledge management practices and can improve especially the efficiency of knowledge workers (ibid., p. 22). Moreover, Corso et al. (2008, p.599) see that Enterprise 2.0 enables a broader scale transition towards new organizational models based on open involvement, emergent collaboration, knowledge sharing, and internal/external social network development and exploitation. Thus Enterprise 2.0 seems to involve tightly in all kinds of business operations and also extends the traditional boundaries of a firm. This development is in line with the general trends discussed in chapter 2.

Most other concepts presented in table 3.1 can be seen as extensions of Enterprise 2.0; according to our experiences concepts like open-source, open innovation, and crowdsourcing all have their own principles and ideologies, yet each of them also benefits greatly from recent ICT developments and Web 2.0 technologies. For example, open-source is well-known for its open attitude and collaborative nature in software business (see e.g. Brabham 2008, pp.81–82), and digital platforms, online communities and other social technologies are in key role in open-source implementations. Quite essentially, from business perspective the use and implementation of the concepts in supporting and executing business operations is in focal point.

Most of the time in business context it is not the question of whether social software and Web 2.0 applications will be introduced in companies; instead the focus has shifted on how to implement them successfully (Back & Irmler 2012, p.221). We argue that the previous statement essentially advocates considerations on how Web 2.0 technologies and concepts (see table 3.1.) can contribute in the creation and capturing of value in organizations and businesses. Within the scope of this study, we are going to discuss

crowdsourcing, swarm-work and gamification, as we believe they can offer suitable solutions for delivering these successful implementations and contribute in the general debate over novel value creation approaches. As we will soon see, all the selected concepts are enabled by, and benefit from, the use of Web 2.0 technologies. Moreover, all the concepts provoke collaboration that extends the traditional boundaries of a firm, and support the systemic view of value creation. This way, we believe that the selected concepts offer new ways for benefitting from collective intelligence and enable novel value creation approaches where the potential and benefits of social media and crowds can be captured.

3.2. Crowdsourcing

In the beginning of 21st century, crowdsourcing started to gain increasingly attention among academics and business practitioners, even though the concept itself is much older (see e.g. Hopkins 2011, p.16). Term crowdsourcing is coined by Jeff Howe in 2006, and it is defined as an *"act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call"* (see Howe 2006; 2008). The definition aroused a lot of debate among researchers and quickly several other definitions emerged. In a recent literature review, Estellés-Arolas and González (2012) looked through over 40 definitions in order to create an integrated definition for crowdsourcing:

"Crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task. The undertaking of the task, of variable complexity and modularity, and in which the crowd should participate bringing their work, money, knowledge and/or experience, always entails mutual benefit. The user will receive the satisfaction of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, while the crowdsourcer will obtain and utilize to their advantage that what the user has brought to the venture, whose form will depend on the type of activity undertaken." (Estellés-Arolas & González 2012, p.197.)

Even though the above definition is rather exhaustive, it withholds all the elements, which also we see are important for crowdsourcing. These aspects include the online nature of the concept, crowdsourcer's and crowd's roles, task centricity and mutual benefits. Drawing from the definition it is quite obvious that the concept itself is widely applicable in different business and other functions. However, current literature holds still no agreed-upon definition of crowdsourcing (Estellés-Arolas & González 2012). Moreover, crowdsourcing is closely related, and mixed, with other relatively new concepts that benefit from crowds or collective intelligence (see e.g. Aitamurto et al. 2011; Hopkins 2011; Penin & Burger-Helmchen 2011; Schenk & Guittard 2009;

Marjanovic et al. 2012), such as open innovation, open source and user innovation, which is why it may be hard to identify what kind of activities actually are crowdsourcing and what are not. Also the theoretical foundations for categorizing crowdsourcing in relation to other concepts are still thin (Simula 2013, p.2784).

One way to understand crowdsourcing is to see it as a tool for implementing other concepts, for example open innovation (Hopkins 2011, p.15; Marjanovic et al. 2012, pp.320–321). Importantly this kind of approach brings the concept closer to business environments and business models where crowdsourcing is based on strategic decisions of carrying out different actions or solving a problem by utilizing crowds (Penin & Burger-Helmchen 2011, p.249). Following this perspective it is essential to analyze the actual crowdsourcing functionalities (e.g. what kinds of tasks can be crowdsourced) and their nature.

Scientific literature holds multiple categorizations for different crowdsourcing functions (see e.g. Kärkkäinen et al. 2012, p.135; Simula & Vuori 2012). Examining the literature led us into a conclusion that most categorizations form around either the nature of the task (see Rouse 2010; Penin & Burger-Helmchen 2011; Schenk & Guittard 2011) or the task itself (i.e. the function) (see Howe 2008; Vukovic 2009; Brabham 2011). Categorizations based on the nature of the task acknowledge a general approach for determining what kind of functions can be crowdsourced by determining the tasks to be simple, routine, moderate, complex/sophisticated, or creative/inventive (Rouse 2010; Penin & Burger-Helmchen 2011; Schenk & Guittard 2011, pp.98–101). Rouse (2010) argues that this kind of categorization grounds on the capabilities and skills suppliers (i.e. crowd) need to have in order to fulfill the crowdsourced task. Thus crowdsourcing simple tasks require only moderate education and training, and are easily evaluable (Rouse 2010). The task itself is rather poor from cognitive point of view and requires low involvement from the suppliers. However, complex or sophisticated tasks involve knowledge intensive activities. (Schenk & Guittard 2011, p.99.) These tasks are complex and difficult to evaluate; they often require substantial domain knowledge and professional experience.

Categorizations based on the task or activity offer a wide variety of different functions that can be crowdsourced. Howe's (2008, pp.280–282) categorization includes sorting out masses of data with voting, collaborative creation of (digital) products and content, voluntary donating of money, and problem solving with the crowd's input. Vukovic's (2009) categorization spans through the different parts of product or service life cycle (i.e. design and innovation tasks, development and testing, and marketing and sales) showing that crowdsourcing is applicable in all the phases of product life cycle. (ibid,p.688.) Brabham's (2011) crowdsourcing types are similar to Howe's but strongly related to problem solving activities and collecting and processing of information.

Importantly these categorizations manage to bring some clarification into the general topic of crowdsourcing (Kärkkäinen et al. 2012, p.135) by identifying certain functions or business activities where crowdsourcing is applicable. Many of the models rely either on integrative or selective aggregation of inputs from the crowd (Schenk & Guittard 2011, p.98). Integrative approaches, such as crowd wisdom, enable collection of heterogeneous inputs and formation of best solutions from them. Selective approaches aim to fulfill a specific need and the inputs are pruned based on certain criteria (Schenk & Guittard 2011, p.98). However, merely discussing categories and their abilities fail to describe accurately the practical implementation that is especially interesting from business point of view.

The practical implementations of crowdsourcing link the potential of different crowdsourcing models within business model implementations or specific business functions (e.g. solving a specific business problem). The different roles of actors and the general environment of crowdsourcing are presented in figure 3.1.

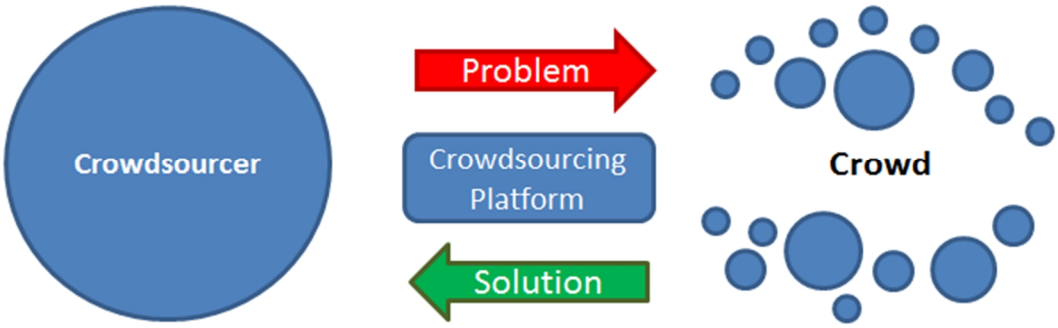

Figure 3.1. *General crowdsourcing environment (adapted from Vukovic 2009, p.687; Geiger et al. 2011; Penin & Burger-Helmchen 2011, p.249)*

According to the above figure, crowdsourcing involves three different actors and their interactions: crowdsourcer, crowdsourcing platform and crowd (Vukovic 2009, p.687; Penin & Burger-Helmchen 2011, p.249). Crowdsourcer is an entity that decides to crowdsource a task or a problem, and is thus often seen as the initiator for the crowdsourcing process (Vukovic 2009, p.687). Crowdsourcing platform is an online platform, web-site, web-application or other system which handles all the data needed to carry out the crowdsourcing effort (e.g. authentication of users, charging and payments etc.) (Vukovic 2009, p.687; Kärkkäinen et al. 2012, p.138). The platform can be either company owned (i.e. crowdsourcer's own platform) or a service offered by a special intermediating firm (Kärkkäinen et al. 2012, p.138).

The task or problem is introduced for the crowd through a call mechanism. The call mechanism enables preselecting of contributors or making the crowdsourcing task public. Geiger et al. (2011) argue that preselecting contributors can be based on

qualities (e.g. skills and capabilities) or context (e.g. company employees), and they aim at finding the right persons for solving the task. Open call, in turn, means that practically anyone can contribute in the task (Penin & Burger-Helmchen 2011, p.249). Thus, rather generally, crowds are individuals of varying knowledge, heterogeneity and number. They consist of individuals from companies, non-profits, organizations, communities or are individual professionals. (Kärkkäinen et al. 2012, p.136.)

Implementing crowdsourcing essentially means that crowdsourcer intentionally introduces a task or a problem for the crowd to solve, and then remunerates the crowds effort after the solution is achieved or the task is done (Geiger et al. 2011). Of course, there are different ways of doing this but in general the process includes formation of the task, publishing the task, aggregation of contributions, assessment of results and remuneration of the crowd. The process focuses on describing the causalities between different functions and the roles of different actors involved, in a logical order. There are various examples of crowdsourcing initiatives in business environments varying from commercial examples, including iStockphoto, Threadless (see e.g. Brabham 2008) and Lego (Li & Bernoff 2009), to B2B environments (see e.g. Kärkkäinen et al. 2012; Simula & Vuori 2012), including cases such as IBM Innovation Jams (Bjelland & Wood 2008), Dell's IdeaStorm (Kärkkäinen et al. 2012) and GoldCorp Challenge (Brabham 2008).

Even though crowdsourcing has gained relatively much attention in recent literature (see e.g. Howe 2008; Vukovic 2009; Brabham 2011), analysis of crowdsourcing related potential and benefits (see e.g. Dawson & Bynghall 2011; Afuah & Tucci 2012; Kärkkäinen et al. 2012; Simula & Vuori 2012) and crowdsourcing related value creation (see dialogue Afuah & Tucci 2013; Bloodgood 2013) have had considerably less attention. Moreover, the discussion regarding crowdsourcing and its benefits in academic literature is often quite optimistic, and typically only the successful examples are nurtured (Simula 2013, p.2785).

Value creation through crowdsourcing lays on Howe's (2008) central idea that organization's own resources are but one source for organizational capabilities; the crowd outside company borders withholds expertise and knowledge which can be used to complement or compensate the organization's own resources in value creation. Thus, crowdsourcing is an approach enabling co-creation of value and collaboration in a wide variety of business operations. In this process social media and Web 2.0 technologies are in essential role for enabling accessibility to the crowdsourcing activities and delivering the contributions of the crowd. The gained novel resources can, in turn, lead to potential new business opportunities or capturing knowledge and expertise by effectively pooling the problems and problem solvers (Dawson & Bynghall 2011, pp.14–15). Simula and Vuori (2012) state that using crowds enables plenty of chances for serendipity, facilitates 'out-of-the-box' thinking, generates truly new innovations

and ideas for the company, and promotes brand goodwill. Moreover, Marjanovic et al. (2012, p.321) see crowdsourcing as a promoter for interdisciplinary knowledge transfer – existing knowledge, scientific and technological advances are taken from one field to provide solutions to the problems of another field.

Benefits for crowdsourcing are often linked to innovation and product development processes (e.g. because of heterogeneity of new ideas). Dawson and Bynghall (2011, pp.14–15) argue that crowdsourcing reduces costs and increases the speed in product development processes. Using different crowdsourcing functions and models enables collection of multiple inputs at the same time. Moreover, crowds can be used to sort out or evaluate the results, so no additional resources are wasted in those activities (Simula & Vuori 2012). Often the inputs gained from the crowds are enormous compared to company's own resources (Dawson & Bynghall 2011, p.15); for example problem solving through crowdsourcing may involve hundreds and thousands of individuals instead of one team or one unit. In addition, some of the crowdsourcing types are based on voluntary work or alternative motivating factors as money and tangible remuneration, and thus crowdsourcer may benefit from relatively low costs (Schenk & Guittard 2011, p.101).

Even though some general benefits of crowdsourcing have been identified and discussed, we do not want to give too optimistic picture of the whole. Firstly, it is often more accurate to use term 'potential benefits' instead of 'gained benefits'. Marjanovic, et al. (2012, p.322) see that there is a general lack of reliable research-informed empirical evidence on crowdsourcing's effectiveness, best practices, and policy-relevant implications. Secondly, the 'benefits' always include the 'who' perspective (Rouse 2010). Crowdsourcing involves multiple actors (e.g. individuals, companies, organizations, communities), and thus it can be somewhat unclear which actors contribute in co-creating the value or benefits and how. Thirdly, a dialogue between Afuah and Tucci (2013) and Bloodgood (2013) is interestingly pointing out that some of the benefits concerning crowdsourcing may have been amplified more than necessary; Bloodgood (2013) argues that viewing a single capability of crowdsourcing (e.g. capabilities for distant searches) may be repealed if wider context (e.g. value creation) is assessed. For example if a company openly discusses of its problems in product development, important knowledge may be given to competitors, and thus the overall gain may be diminished. Value creation is indeed a complicated process where correlations between different parts may be hard to distinguish. Thus, we acknowledge that considerably more research is needed to confirm some of the general benefits discussed here.

3.3. Swarm-work

The words 'swarming' and 'swarm' easily bring forth memories from biology lectures, and remind us of nature's own way of organizing. For example, many insects and animals move, forage and work in swarms (e.g. ants, bees, wolves, birds). The idea behind swarming is that a large group of rather simple components (e.g. insects) work together to achieve a goal and produce significant results – simple behavior may conjure complex actions (Hinchey et al. 2007, p.111). This ideology is often described as swarm intelligence (see e.g. Bonabeau & Meyer 2001, p.109; Beni 2005, pp.3–7; Hinchey et al. 2007, p.111; Salminen 2012). Despite the strong biological foundations of the concept (see Beekman et al. 2008), it has been used widely in some areas of computer science (e.g. optimization and robotics) (Hinchey et al. 2007, p.111) but also in social sciences when examining collective behavior of humans (Salminen 2012).

Swarm-work is a relatively new concept which combines the basic principles of swarm intelligence with recent developments in organizational behavior (Ruohisto 2013). The term itself is not used in scientific literature and merely presents a translation of its Finnish counterpart[2] which we discovered during our literature review. Other near relatives for the term include swarm business (Gloor & Cooper 2007), learning by swarming (Engeström 2009) and work swarms (Gartner 2010). More generally, some authors discuss the same issues under the term swarm intelligence (see e.g. Bonabeau & Meyer 2001, p.112) without naming the concept in any other way. Before looking deeper into swarm-work it is relevant to discuss the general principles of swarm intelligence, as the concept clearly builds on it.

Swarm intelligence cannot be defined unambiguously. One general definition describes it to be collective, and rather self-organizing, behavior emerging from a group of social insects (Bonabeau & Meyer 2001, p.109; Salminen 2012). This behavior consists of the group's local interactions including interacting with the environment. The intelligence arises when interactions are aggregated; each member's independent intelligence is combined with the group behavior. (Hinchey et al. 2007, p.111.) However, in computer sciences swarm intelligence often refers to a modern artificial intelligence discipline or field of research concerning behavior of multiagent systems (Beni 2005; Blum & Merkle 2008, p.vii). Thus in this context the concept may represent meta-heuristic approaches to solving optimization problems or include examining group behavior of robots (Hinchey et al. 2007, p.111).

In social sciences the term is closely related with collective intelligence or even crowdsourcing (Salminen 2012); *"it is a form of universally distributed intelligence,*

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[2] '*Parvityö*' in Finnish

constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills" (Lévy 1997, p.13). Moreover, according to a recent literature review (Salminen 2012), only few articles on swarm intelligence concern swarming in human context; most of the literature is about robotics and optimization. Thus it is relevant to seek further understanding also among collective intelligence literature, which clearly emphasizes the human context but also distinguishes the potential of different novel technologies and their features enabling the concept (see e.g. Malone et al. 2009).

We recognize that certain typical characteristics and principles of swarm intelligence are enabled no matter what perspective (e.g. computer science or social science) is adopted. Table 3.2 outlines the general principles of swarm intelligence. We believe that these principles appear differently in different contexts (e.g. robots vs. humans). The following discussion considers how the principles are present in swarm-work.

Table 3.2. *Three principles of swarm intelligence*

Principle	Definition
Robustness	The structure of the swarm is inherently redundant; a loss of an individual component is compensated by another component (Bonabeau & Meyer 2001, p.111; Şahin et al. 2008).
Self-organizing	*"Self-organization is a process in which pattern at the global level of a system emerges solely from numerous interactions among the lower-level components of the system. Moreover, the rules specifying interactions among the system's components are executed using only local information, without reference to the global pattern."* (Camazine et al. 2003, p.8.)
Flexibility	Capability to quickly adjust to a changing environment (Bonabeau & Meyer 2001, p.111) by effectively coordinating the behavior in the swarm (Şahin et al. 2008, p.88).

Swarm-work essentially builds on the same ideology that is present in collective intelligence: Intelligence is universally distributed – "*No one knows everything, everyone knows something*" (Lévy 1997, pp.13–14). In today's business environment professionals meet challenges and solve problems that increasingly require knowledge from various knowledge domains. This knowledge is often dispersed around organizations. (Ruohisto 2013, p.16.) In swarm-work, robustness grounds largely on the structure of organizing and in the nature of the swarm instead of the original notion of

compensating failing components[3]. As we argued earlier 21st century business environments include a strong network perspective. However, Miles et al. (1999, p.158) argue that the current way of organizing in business cases (e.g. solving a business problem) includes more increasingly a cellular approach. Swarm-work taps into this notion by aggregating and organizing different skills and capabilities in organizations and knowledge networks based on the context or situation at hand (Ruohisto 2013, p.17). Thus swarm-work enables a heterogeneous compilation of knowledge by gathering the right individuals into a swarm to contribute for achieving the common goal. Moreover, the swarm's intelligence is constantly enhancing as the swarm operates together (Lévy 1997, p.14).

Self-organizing refers to activities that are neither centrally controlled nor locally supervised. In business context this kind of arrangement is inherently difficult from the management perspective although scientifically it may be the most intriguing. (Bonabeau & Meyer 2001, p.108.) Self-organizing relies on division of tasks based on simple rules and stigmergy (Bonabeau & Meyer 2001, p.108; Engeström 2009, p.7). Stigmergy is a mechanism of spontaneous, indirect coordination between agents; actions taken by the agents work as stimuli for the performance of subsequent actions (Engeström 2009, p.7). In human swarms the behavior of the group emerges from collective interactions of swarm members (Bonabeau & Meyer 2001, p.108) while solving business cases (Ruohisto 2013, p.17). The traditional notions of 'simple' rules and stigmergy have to be widened in this context. In swarm-work, individual's intrinsic and extrinsic motives are in significant role when choosing how and when to contribute in achieving the common goal (Ruohisto 2013, p.17). Arguably also the rules in business context are more complex and more dynamic (see e.g. Bonabeau & Meyer 2001, p.111) than in the traditional definition. For example, business decision may also require utilization of other than local information and understanding of global patterns (see the definition in table 3.3). Self-organizing is probably the most important principle of swarm intelligence, and, to a large extent, the other two principles can be seen to result from it (Bonabeau & Meyer 2001, p.108).

The last principle of swarm intelligence is flexibility. Flexibility emerges through self-organization; when a swarm detects a change in the environment, it immediately starts to adapt by reacting to stimuli and taking corresponding actions (Bonabeau & Meyer 2001, p.108; Şahin et al. 2008, p.88). Understandably certain openness in swarm interaction is required to achieve this (Gloor & Cooper 2007). This includes, for example, sharing of information openly in the swarm, making actions transparent to everyone, and giving power in decision making process to the swarm (ibid.).

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[3] The notion of robustness originates from insect swarms, where failure or elimination of one insect is compensated by other insects.

The literature on swarm intelligence topics has grown significantly since the end of 20th century (Blum & Merkle 2008, p.viii), and many authors believe that swarming and swarm intelligence can be used to solve many kinds of practical problems (see e.g. Tarasewich & McMullen 2002, p.67). Case examples include, for instance, optimization and algorithm based solutions for logistic problems in various industries (see e.g. Bonabeau & Meyer 2001; Yang et al. 2007). However, less case examples exist on swarm intelligence in human context. This might be due to concept's close relations with crowd-based approaches and collective intelligence. Few swarm business examples include collaborative innovation in automotive (BMW), software (IBM) and retail (Migros) industries (see more in Gloor & Cooper 2007). According to our view, these examples do not purely represent swarm-work, and are more closely related to crowdsourcing.

We also found some case examples for swarm-work. Bonabeau and Meyer (2001, p.112) introduce a Web service for posting solutions and ideas to support company's innovation process. The service is set up to be self-selecting; promising ideas attract more attention and lure in contribution from others. Certain motivating mechanisms are in place but in the end individuals can freely decide whether they will contribute or not. Also Ruohisto (2013) discusses of similar application, namely xTune. xTune is discussed in more detail in the empiric part of this thesis. Both cases illustrate how swarming is utilized as a new way of organizing, and how technology is essentially enabling it.

We believe that much of the potential of swarming and swarm-work in value creation is yet to be revealed. In general swarm-work aims at creating value by enhancing services and business functions with more flexible and effective access to knowledge in networks and organizations (Ruohisto 2013, p.17). Thus, essentially swarm-work relates to new ways of organizing and dividing tasks between different persons according the principles introduced earlier. However, the benefits of swarm-work may be harder to measure than in other swarm intelligence applications. For example, optimization based solutions may generate considerable cost savings through practical adjustments in logistics or supply chains, and thus generate clear business benefits (see e.g Bonabeau & Meyer 2001) but effectiveness or benefits of collaboration may be harder to estimate. New ways of organizing through swarm-work often require not only integration of swarming technologies and software with company's information systems, but also certain maturity and organizational culture, with novel management practices in place (Ruohisto 2013, p.17).

3.4. Gamification

Gamification is a term originating from the digital media industry in the beginning of 21st century (Deterding et al. 2011, p.9; Groh 2012, p.39), and it is defined as "*the use of*

game design elements in non-game contexts" (Deterding et al. 2011, p.9). Practically the concept does not solely refer to the actual games or gaming technologies, such as digital video games and game consoles, nor to board games and games that kids play outside, but to the universal characteristics or elements of games and their design applied to mundane and business applications (Juul 2003; Deterding et al. 2011, p.13; Liu et al. 2011). Consider a situation where you ask a group of people to perform any simple task (e.g. walking to a door) compared to a situation where you promise a reward to the first who reaches the door. The latter situation is gamified through adding certain game elements (i.e. rewards), and most likely this will also affect the motives and behavior of group members while performing the task (Janitzek 2012, p.8).

The above example demonstrates that gamification can be applied to almost any situation. Value of the gamifying elements is also eventually determined by the player's individual perception (Huotari & Hamari 2012). Thus gamification holds strong connections to psychological concepts such as Self Determination Theory (SDT), which we are only going to discuss marginally in this thesis (see more Csikszentmihalyi 1991; Hoffman & Novak 2009; Deterding 2011; Janitzek 2012, p.24). Also, even though the aforementioned definition of Deterding et al. (2011, p.9) is widely accepted we acknowledge the criticism it has gained. Huotari and Hamari (2012) define gamification as *"a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation"*. This view suggests that gamifying functionalities are secondary and supportive in relation with the primary service or product. Moreover, according to this definition, the gamifier tries to increase the likelihood of gameful experiences by adding *affordances* (and not game elements) in services and products to generate more value for the users (i.e. players). (ibid.) Somewhat contradictory linkage between affordances and game elements exists: Huotari and Hamari (2012) argue that affordances can be game elements or other implicit cues, and Deterding (2011) sees that game elements cannot be universally defined but are specifically based on motivational affordances (Deterding 2011; Deterding et al. 2011, p.12).

Gamification literature agrees on some general game elements that have been noticed to have an effect on gamifying, and the motives and behavior of players. Game elements can be defined as tools, actions, or behavior (i.e. logic) that create the game infrastructure (Rampoldi-Hnilo & Snyder 2013, p.310) but can also be found in broader game ecology – '*outside'* the context of one specific game (Deterding et al. 2011; Groh 2012, p.40). Table 3.3 introduces some identified game elements.

Table 3.3. *Identified game elements (Deterding et al. 2011; Sampanes 2013; Hamari et al. 2014)*

Identified game elements		
• Points	• Leaderboard	• Badges /Trophies
• Achievements	• Levels	• Story / Theme
• Clear goals	• Feedback	• Rewards
• Progress	• Challenges / Missions	• Reputation
• Constraints / Rules		

Most of the above mentioned elements are quite self-evident and familiar to us from mundane applications we are using. We can easily recall some storylines or missions from the videogames we have played or remember participating in a survey questionnaire in hope of winning a reward. We like to see our progress towards a goal through points, levels, badges and achievements, and moreover, we want to compare our progress with others and see the results on leaderboards. (see more examples in Hamari & Eranti 2011; Janitzek 2012, pp.54–55; Sampanes 2013, pp.285–288.) These elements are not mutually exclusive and are often used simultaneously to provide the gamified experience for the users (Huotari & Hamari 2012; Sampanes 2013, p.286) (e.g. gathering of a certain amount of points will result in rewarding). However, points, leaderboards and badges are the most common elements used in gamification applications (Hamari et al. 2014).

Designing game logic and the integration of game elements in products and services are the ultimate manifestations of gamification and gamifying – this can be derived from the definition of the concept (Deterding et al. 2011; Huotari & Hamari 2012). But what are the reasons for pursuing such activities? Huotari and Hamari (2012) argue that gamification works essentially as a supporting or enhancing mechanism for services and products to offer users increased value while serving certain business needs. Currently there is a gamification movement in both digital and traditional industries towards gamifying the existing products and services (Liu et al. 2011). It is argued that game elements are able to turn non-game products and services more enjoyable and engaging (Deterding et al. 2011). For users (i.e. players) the increased value gamification brings is often joy, amusement, excitement, meaningfulness or other fulfillment of an individual need together with the primary service or product (Huotari & Hamari 2012; Swan 2012, p.13). These are often aspects that are nowadays very natural for many users and especially for the Millennials (Swan 2012, p.13; Rauch 2013, p.277).

For businesses, increased engagement can potentially generate a wide variety of benefits such as customer loyalty, enhanced learning and innovation, better motivation and retention of employees, brand awareness, increased sales and profits, and even competitive advantage (see e.g. Zichermann & Linder 2010; Hamari & Koivisto 2013;

Maan 2013; Rauch 2013, pp.276–277). In general, the design and implementation of gamified applications require heavier work but also have a greater impact on incentivizing and affecting people. The operating costs are light due for example the overlap of social and game-based incentives and increased competitiveness among players (Liu et al. 2011). However, Hamari et al. (2014) argue that gamification is currently a hot marketing topic with presumptions ranging from extremely negative to positive perceptions. There is still a lack of empirical results on the effectiveness of gamification, and thus it is challenging to gain an unbiased view of the potential of the concept. According to their literature review, majority of reviewed case studies represent positive results or effects of gamification but only in part of the considered relationships between game elements and studied outcomes (ibid.) Moreover, current hype around gamification enables mostly positive media cover and failed cases for gamifying are not readily available (Janitzek 2012, p.52; Hamari et al. 2014).

In practice gamification involves participation and co-production of at least two different actors: the gamifier and the player. More recently there has been a great upsurge of different intermediaries offering gamification as a service (Deterding et al. 2011; Janitzek 2012, p.44) This way businesses can also use the services of third party vendors while focusing on the core business themselves. Often, if not always, gamification also involves a specific platform where the game is played or game elements embedded (Janitzek 2012, pp.43–44). Platforms are similar to those of crowdsourcing platform (see chapter 3.2.); they can be specific company internal platforms or integrated components in company intranet (Rauch 2013, pp.277–280), or gamification vendor provided public online platforms (e.g. Adobe's Bunchball) (Janitzek 2012, p.44) depending whether the gamification efforts are internal (e.g. engaging employees) or external (e.g. engaging customers). Public platforms bring gamification very close with crowdsourcing; in fact, game elements are often essential part of any crowdsourcing system (Hamari et al. 2014).

Gamifiers, or the game developers, design the game logic and game elements regarding the game, and the players' part of co-production and value creation takes place each time interaction in the game occurs (Huotari & Hamari 2012). Key idea here is that the game provides meaningful tasks, challenges and mechanics that make the game engaging and sticky but also aim towards a specific business need (e.g. solving a business problem) (Maan 2013, p.10; Rauch 2013, pp.280–281). Thus, gamifying is a careful balancing of game elements and business goals; game elements are used to guide or steer user behavior towards a wanted result with a sense of autonomy left for the player (Deterding 2011). This steering and designing of games can be measured with a concept called *Flow*. The state of flow has the potential to make activities more rich, intense and meaningful by increasing strength and complexity of the self. Concept of flow was originally developed by Csikszentmihalyi (1991) for psychological purposes for examining experiences and experiencing but more lately applied in

computer mediated environments and games (see e.g. Hoffman & Novak 1996; Hoffman & Novak 2009; Huotari & Hamari 2012).

Hoffman and Novak (2009, p.25) built a conceptual model for flow, to analyze the different aspects that keep the users motivated and engaged in digital environments. In this context game elements have been noticed to affect the flow variables and motivate users (see e.g. Zichermann & Linder 2010; Huotari & Hamari 2012; Janitzek 2012, p.25). Most often the discussions focus on rewarding; there is a lively debate on whether game elements can provide intrinsic as well as extrinsic motivation and rewards (see e.g. Liu et al. 2011; Huotari & Hamari 2012; Sakamoto et al. 2012). Usually extrinsic rewarding (e.g. physical and digital products) undermine the intrinsic (e.g. motivational affordances) (Hamari et al. 2014). Yet, extrinsic rewarding is often easier in gamification applications, and it falls out of the scope of this study to discuss to what extent the game elements are able to fulfill the intrinsic motives of users.

At this point it is clear that gamification is not a simple concept, yet it may offer great potential for businesses and organizations both internally and externally. According to our experiences gamification essentially links to value creation through enhancing services and business operations with game elements which enable gameful experiences and make the services stickier and more engaging to players (Huotari & Hamari 2012). Thus, we agree on the notion that gamification initiatives are secondary and supportive regarding the primary service or product (ibid.) or value creation. Still, Rauch (2013, p.282) argues that due to novelty of the concept, best practices on implementing and benefitting from gamification are yet to be revealed, but successful examples of gamification may hold the key for unraveling them. In this context games and gamifying have gained increased attention in both scientific literature and business contexts during the last few years (see e.g. Deterding et al. 2011; Groh 2012, p.39; Huotari & Hamari 2012; Janitzek 2012, p.8; Hamari et al. 2014). Documented gamification applications include for example cases from digital marketing and consumer engagement, education and learning, intra-organizational systems and work engagement, as well as innovation (see Zichermann & Linder 2010; Herzig et al. 2012; Rauch 2013; Sampanes 2013; Hamari et al. 2014).

3.5. Novelty of the selected concepts

After the introductions to selected concepts we can focus on discussing the novelty and the potential of crowdsourcing, swarm-work, and gamification regarding value creation and its new trends. Even though all of the selected concepts are based on ideologies, ideas or concepts utilized already many years – even hundreds of years – ago. Crowdsourcing and swarm-work fundamentally rely on collective intelligence of humans or wisdom of the crowds. These ideologies are not novel per se – in some forms these concepts have been researched over decades ago. (see e.g. Surowiecki 2005;

Howe 2008; Hopkins 2011.) Gamification is fundamentally based on the psychological aspects of humans and their motives (see e.g. Csikszentmihalyi 1991; Hoffman & Novak 2009; Deterding 2011; Huotari & Hamari 2012). Games have always fascinated us, and competing is inevitably present in our everyday lives – consider, for example, business environments where companies compete in markets. Besides the psychological and motivational studies, also game study research began already in the early 1980s due to technological advances in computing (Deterding et al. 2011).

Still, somehow all these concepts have emerged *now* as hot topics, accumulating great hype around them particularly in business context. Significance and relevance of crowdsourcing, swarm-work, and gamification was widely accepted in the beginning of 21st century. Also Gartner, the leading technology research company, considered them in their Hype Cycle Research. In 2010 Gartner's researchers forecast that organizations and working environments would face considerable changes, and much of these changes would relate to swarming and working in swarms instead of traditional projects, teams and organizational hierarchies (Gartner 2010). A year after that gamification was positioned to the hype-cycle nearly in the peak of inflated expectations with estimates of reaching mainstream adoption in 5 to 10 years (Gartner 2011b). According to some estimates gamification is already widely accepted in external functions (e.g. marketing) especially in B2C context, but internal business applications are still catching on (Webb & Cantú 2013, p.316). Gartner forecasts that by 2014 over 70% of Global 2000 companies[4] will have at least one gamified application; by 2015 over 50% will gamify their innovation processes. (Gartner 2011a) Also crowdsourcing was added to hype-cycle studies in 2012, and positioned on the edge of the peak of inflated expectations with the same estimates for reaching mainstream adoption as gamification had (Gartner 2012). Both internal and external crowdsourcing applications exist – yet it seems that B2B cases are scarcer than B2C applications (see e.g. Kärkkäinen et al. 2012, p.134).

As we discussed earlier, digitalization and the rise of social media and global collaboration as well as other developments in ICT applications have fundamentally changed the world. This development can also be seen as the key enabler of crowdsourcing, swarm-work, and gamification. Brabham (2011) argues that crowdsourcing, and more generally other collective intelligence applications (including swarming and swarm-work), are *necessarily dependent* on the Internet, and social networking due to their characteristics and capabilities. For example the speed, reach, anonymity, and opportunities for asynchronous engagement as well as the ability to carry many forms of media content are all crucial for participatory activities. Participatory activities are nothing new since cultures have been participatory long

[4] Forbes' listing of the world's largest public companies measured by sales, profits ,assets, and market value (according to: www.forbes.com/global2000/)

before Internet. However, Internet as a technology elevates the quality, amount and pace of cooperation and coordination to a whole new level. (Brabham 2011.) The same abilities can be seen as the key trigger for the rise of gamification as well (Janitzek 2012, p.43). Thus the novelty of the concepts stems at least partially from their recent emergence.

However, in the context of this thesis it is relevant to discuss the novelty regarding value creation activities in general. Drawing a conclusion from the previous chapters there seems to be two mainstream perspectives for applying crowdsourcing, swarm-work, and gamification in business to generate value: The first perspective views the concepts as business models where the selected concepts are digital services. This refers to the services third party platform providers or EIMs are offering. Examples include Threadless and Innocentive in crowdsourcing (see e.g. Brabham 2008) and Bunchball in gamification (Janitzek 2012, pp.43–44). The second perspective refers to the concept's supportive or contributing nature in value creation; the applications of the selected concepts are implemented to support other business functions or operations. In practice, this often includes using the services of EIMs or developing own technical solutions for implementing the concepts. Examples include using crowdsourcing in innovation or problem solving activities (see e.g. Brabham 2008; Afuah & Tucci 2012; Kärkkäinen et al. 2012), swarm-work in knowledge sharing (Ruohisto 2013), or gamification in educational and learning context or in innovation and ideation functions (Hamari et al. 2014).

In chapter 2 we outlined some general characteristics of value creation that epitomize current ways of creating value. It can be argued that the principles behind crowdsourcing, swarm-work and gamification offer several possible connection points with novel value creation characteristics. Firstly, Kauffman et al. (2010) argue that business network-based value creation is fundamentally IT-enabled and relies on IT's ability to support value co-creation between companies and their partners by engaging also customers and users into the processes. (Kauffman et al. 2010, p.133.) According to our experiences crowdsourcing, swarm-work and gamification are all examples of ICT and Web 2.0 technology enabled concepts that can support the value co-creation processes.

Secondly, crowdsourcing and swarm-work are based on collective intelligence which essentially provokes collaboration and interaction between multiple parties (see e.g. Howe 2008; Salminen 2012). Also many gamification applications have been designed for different social networking or otherwise social contexts, and several game elements relate to these aspects (e.g. leaderboards and reputation among other players) (Deterding et al. 2011; Janitzek 2012, p.26). Increased collaboration and multiple parties contributing in organization's operations support the view of co-creating value in the

value system. Thus, the selected concepts reflect collective intelligence and offer new possibilities for value creation by utilizing Web 2.0 technologies and social media.

Thirdly, complexity in coordination and the rise of EIMs are typical issues regarding novel value creation approaches (see e.g. Koppius & van Heck 2005; van Heck & Vervest 2007; Basu & Muylle 2008). Similarly regarding the selected concepts, digital service providers are responding to the increased complexity in coordinating the collaboration in the value networks by offering digital platforms or services for realizing collective intelligence or gamification efforts (see e.g. Janitzek 2012, p.44; Kärkkäinen et al. 2012, p.137; Marjanovic et al. 2012, p.325).

Finally, and probably most importantly, there are several analogies with modularity. In networked environments different business operations or manufacturing of products is often modularized and distributed between multiple network actors (see e.g. Konsynski & Tiwana 2005; van Heck & Vervest 2007). Similarly, applying crowdsourcing and swarm-work in different business functions enable modularization and distributing of work tasks or business functions, and gamification may provide the essential motivation for performing them. This only rarely includes manufacturing of physical products. However, the potential for distributing knowledge intensive activities is high as they are often more agile. Moreover, crowdsourcing and swarm-work activities may offer easy approaches for connecting and disconnecting actors in business functions, which is also a characteristic of novel value creation (see e.g. Koppius & van de Laak 2009).

Several arguments support that the selected concepts withhold similarities with novel value creation characteristics. Even so, current literature falls short on these issues. Crowdsourcing, swarm-work, and gamification applications are indeed following the general trends in socializing businesses, and demonstrating human's capability to adapt the dynamic business environments. Goldman et al. (2009, p.53) argue that the general transition towards mobilization of communities, and utilization of openness and novel concepts on strategic levels of businesses requires identifying of value in relationships. More increasingly this value is hidden in weak links, intangible contributions, and informal connections, and thus difficult to quantify (ibid.). Similarly the theoretical foundations for measuring the generated value through crowdsourcing, swarm-work, or gamification are thin. In the end, each case regarding the utilization of one of these concepts is individual, and much depends on *how* and *in which context* they are used. Certainly a lot of work around these issues is required to reveal the potential of these concepts (see also the Discussion chapter).

4. RESEARCH METHODS

This chapter describes the empirical part of the study by first recalling the research questions and objectives of the study. After that there is an introduction to utilized research methods, and their implementation during the research. Finally, we introduce the theoretical framework for analyzing the collected data.

4.1. Introducing the research methods

Recalling from chapter 1, the selected research approach was formalized keeping in mind the research questions and the topic of the study. It was proposed that case study and netnography methods ground the research strategy for this study. Data collection includes multiple techniques: participant observation and focused interviews for each case are used to gain in-depth understanding on the research subject.

The empirical part of this study was used to supplement the findings of the theory part (i.e. chapters 2 and 3), and reflect the theory through the chosen case studies. Literature review also worked as a tool to find important insights on how to focus the case studies around important themes and issues concerning value creation through pioneering value creation models in networks. The purpose of the empirical part is to find answers to several research questions and thus contribute in solving the main research problem. Research questions issued for the empirical part are:

> *What kind of value transactions are there in the studied emerging value creation cases?*
>
> *How do the value transactions form a working value system in the studied networks?*
>
> *How do social media and modern ICT contribute to value creation in the studied pioneering value networks?*

Before describing the structure and the implementation of the research we will introduce the chosen research methods briefly. Theory includes some background of the methods, key characteristics and issues related to each method, as well as basic implementation strategies, which all help us to understand how the methods are used in this study. Special attention is given to netnography, which is usually a less familiar research method especially when not conducting a commercial marketing research.

4.1.1. Case study approach

In the first chapter of this thesis we outlined the research design in figure 1.5 on page 19. We chose multiple-case study approach for our research strategy to meet the requirements of the research problem. Yin (2003, pp.13–14) defines case study as "*an empirical inquiry*" which studies a contemporary phenomenon within its real life context. Case study aims to investigate the case comprehensively by using multiple methods and data sources (Yin 2003, p.14; Ghauri & Grønhaug 2005, p.114) which all appropriately reflect the research problem (Koskinen et al. 2005, p.155). What is considered as '*a case*' varies considerably. Rather than categorizing cases between subjects (e.g. individual, department or organization) and functionality (e.g. a process or an organization's structural function), they should be viewed as a combination of both glued together with the phenomena under investigation, which reflects the chosen research problem (Koskinen et al. 2005, pp.154, 159–160; Yin 2003, pp.22–26).

Yin (2003, p.39) proposes a rough categorization of four different case study designs: a single-case and a multiple-case designs with both having either single (holistic) or multiple (embedded) units of analysis. According to Yin (2003, pp.40–42) single-case design is suitable when the case represents a critical, extreme or unique case worth documenting; a typical or a revelatory case with unique opportunity to observe previously inaccessible or common situation; or a longitudinal case, where the same case is studied at different points in time. Multiple-case study design is often considered more appropriate when researcher seeks exemplary outcomes (i.e. literal replications) or contrasting results for predictive reasons (i.e. theoretical replication) in relation to a specific theory (Yin 2003, pp.47–52).

Case studies can have single or multiple units of analysis depending on the research settings and research objectives. Holistic approach supports the design when the studied cases consist of rather simple entities, such as one department or organization. Embedded approach is often considered when the chosen case or cases are examined extensively with subunits of analysis. (Yin 2003, pp.46–53.) Whichever approach is used – holistic or embedded – the chosen design must be justified explicitly.

The case study in this thesis consists of three different cases related to the research theme. A netnography, consisting of multiple research methods, is utilized to study the chosen cases comprehensively and in accordance with research questions. Case selection criteria and further implementation of research methods is described in chapter 4.2.

4.1.2. Netnography

Netnography is a relatively new research method which has developed from the foundations of ethnography in the late 1990s. Kozinets (2010, p.60) defines

netnography as *"participant observational research based in online fieldwork"* which "*uses computer-mediated communications to arrive at the ethnographic understanding and representation of a cultural or communal phenomenon"*. Netnography is a research method purposefully developed to meet the changing requirements of online qualitative research, and to match the cultural change towards a merged view of offline and online environments (Garcia et al. 2009, p.52), where traditional research methods seemed unconventional and lacked the ability to collect multiform digital data from online environments (Kozinets 1998; Kozinets 2007, p.130; Williams 2007).

The word netnography (see e.g. Kozinets 1998; Kozinets 2007) is merged from two words – Internet (net) and ethnography – referring to a utilization of ethnographic principles and techniques in online settings, namely in the Internet. Netnography should be seen as a wider approach consisting of multiple research methods, approaches and techniques. Choosing the right methods and techniques depend on the research settings and the strengths of the researcher. (Kozinets 2007, p.132.) Netnography expands the traditional 'offline' research settings to also include the digital environments in the Internet. The online and offline social interactions have become strongly entwined and a clear distinction between these two environments is no longer possible (Murthy 2008, p.849; Beneito-Montagut 2011, pp.719–720; Garcia et al. 2009, p.52; Kozinets 2010, p.67).

Drawing from ethnographical principles Kozinets (2010, pp.60–61) has developed a systematic process for conducting netnography. The process consists of five steps, which often (but not always) appear in consecutive order: defining the research settings; identifying and selecting online sites; observing and collecting data; data analysis and iterative interpretation of findings; and presenting the results. Similarities with general research processes are obvious (see e.g. Ghauri & Grønhaug 2005, p.33). Thus, on methodological level, the biggest differences relate to data collection and analysis in online environments, while more traditional methods can be used normally in a joint study of offline and online environments (see "blending ethnography and netnography" in Kozinets 2010, p.65).

Kozinets (2007, p.132) suggests three types of data that can be collected: data directly copied from the computer-mediated communications, data collected observing the online environment, and data collected through interviews (online or offline). Data collection can be conducted in many forms, such as copying multiple forms of interaction (e.g. textual, video, audio), taking screen captures, field-notes, and self-experiencing (Dholakia & Zhang 2004; Kozinets 2007, pp.132–134). Scholars (see e.g. Kozinets 2007, p.132; Beneito-Montagut 2011, p.720) argue that flexible data collection strategy and multiform data is needed to achieve sufficiently rich data for netnography to reveal its full potential.

Even though many scholars have already noticed the benefits and potential of netnography, no research method comes without criticism. The biggest concerns among the scholars seem to relate to methodological aspects of netnography and its validity as a data collection method (see e.g. Kozinets 1998; Kozinets 2006; Sandlin 2007). Issues center around the real versus virtual dichotomy highlighting differences, such as physical or virtual presence of the researcher (Garcia et al. 2009, p.53), and vast availability of information (Kozinets 2006, p.286). The virtual nature and ease of access to online data make the method susceptible to subjectivity (see e.g. Kozinets 1998; Beneito-Montagut 2011) or shallowness of the research (Dholakia & Zhang 2004; Beneito-Montagut 2011). Also, the theoretical establishments and legitimacy of the method are still under development (Maclaran & Catterall 2002, p.325) and the method itself is also constantly evolving (Kozinets 2010, p.184). To fully understand the nature of these issues, and to verify netnography as a full-scale research method would require considerably more discussion and falls out of the scope of this study.

General guidelines give only a loose frame to work with; specific issues have to be addressed individually for each research, and have to be taken into consideration while planning and implementing netnography research. Implementing netnography for the purposes of this study is discussed in chapter 4.2 where some of the above mentioned issues are also taken into consideration.

4.1.3. Participant observation

Participant observation is a fixed part of netnography implementations. Traditionally observation *"entails listening and watching other people's behavior in a way that allows some type of learning and analytical interpretation"* (Ghauri & Grønhaug 2005, p.120). Participant observation is a specific variation of observation in which researcher is not merely a passive observer (Yin 2003, p.93) but can assume different roles (Saunders et al. 2009, p.293). Thus the researcher is often considered to be part of the group or research setting that is studied. (Saunders et al. 2009, pp.289–290.) This lets the researcher to collect first-hand information in a natural or close to natural setting (Ghauri & Grønhaug 2005, pp.120–121). Researchers can collect the data either by experiencing the situation themselves (i.e. *human observation*) or by recording or observing the situation with some technology, such as video camera (i.e. *mechanical observation*) (Ghauri & Grønhaug 2005, p.121).

Gill and Johnson (2010, p.167) have created a taxonomy for different roles a researcher can play during the observation (see figure 4.1). Two aspects – overt vs. covert and participant vs. spectator – form the basis for the framework. Which role to choose depends on several factors, such as the purpose of the research, time available, researcher's characteristics, organizational access, and ethical considerations (Saunders et al. 2009, pp.295–296).

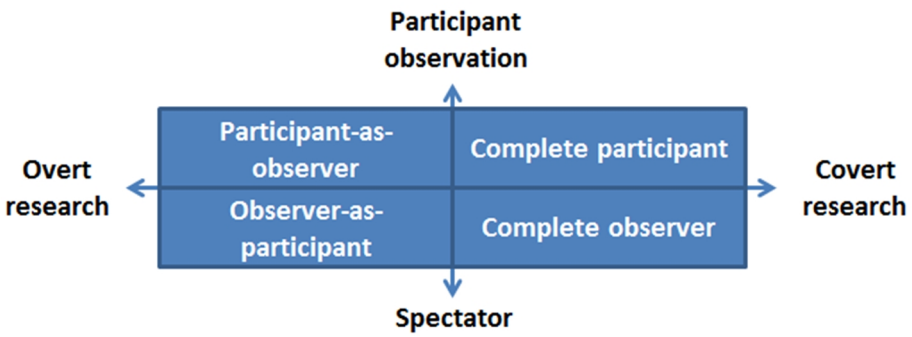

Figure 4.1. *Participant observation roles (adapted from Gill & Johnson 2010, p.167)*

Covert research relates to a situation where researcher's identity is concealed, and the research subjects do not know about the ongoing research (Gill & Johnson 2010, p.165). Covert research can be either participative or spectator-like observation. In complete participant observation researcher attempts to become a member of the group, and takes also part in activities without revealing the true purposes of the activities. Complete observer role includes the same covertness, but the researcher takes no part in activities (i.e. observes the situation 'from a distance'). (Saunders et al. 2009, pp.293–294.) In overt research the researcher reveals his or her true identity and the purpose of the study. Yet again, participant-as-observer role includes taking part in activities in the research setting, while observer-as-participant role settles to observe the situation without participating. (Saunders et al. 2009, p.294.) Conducting the participant observation online in this study is discussed in chapter 4.2

4.1.4. Focused interview

Interviews are a widely used method for collecting data in social research, and a myriad number of variations have been created to meet the requirements of researches. One of them is the focused interview which was developed in the 1940s by Robert Merton and his colleagues. (Hopf 2004, pp.203–205.) Interviews, in general are, purposeful conversations between two or more people (see e.g. Kahn & Cannell 1957). Focused interviews follow the basic nature of interviews with few distinguishing aspects (Merton & Kendall 1946, p.541; Merton et al. 1990, pp.3–5):

1. Persons interviewed are known to have been involved in a particular situation
2. The hypothetically significant elements, patterns, and total structure of this situation have been previously analyzed by the investigator
3. Based on the analysis, investigator has fashioned an interview guide which sets forth the major areas of inquiry and steers the interview towards these areas
4. The interview itself is focused on the subjective experiences of persons exposed to the pre-analyzed situation in an effort to ascertain their definitions of the situation

Keeping in mind the above mentioned aspects, conducting a focused interview resembles loosely the procedures of semi-structured or unstructured interviews. This allows more freedom for the respondent as researcher has only set the interviewing themes with few or no predetermined questions to guide the interview (Saunders et al. 2009, pp.320–321). Implementation of the focused interviews in this study is discussed in the next chapter.

4.2. Conducting the research

Recalling from chapter 1, a multiple-case study strategy establishes the foundation for netnography, and netnography consists of multiple methods namely participant observation and focused interviews. It should be also noted that the empirical part (i.e. the case studies) was designed to fit the requirements of the research plan of the whole study (see the rationalization of the methods in chapter 1). Figure 4.2 describes the full structure of the research and shows the relations between the chosen research methods and data collection techniques.

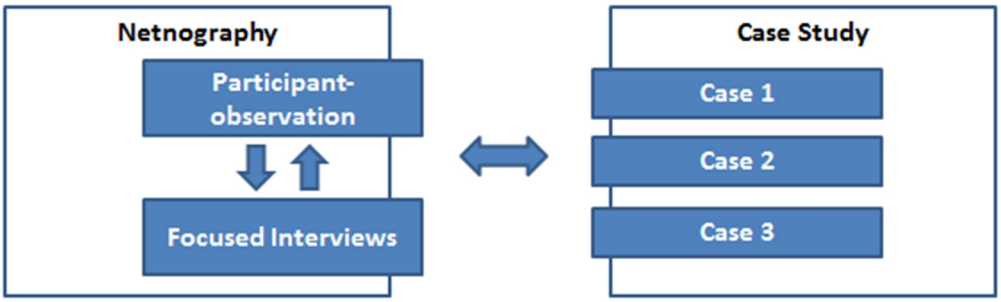

Figure 4.2. *Research methods in relation with data collection techniques*

Each case was investigated separately with netnography consisting of participant observation and focused interviews. Data collection and analysis occurred iteratively: data collected with participant-observation was preliminarily analyzed and the results were used to familiarize ourselves with the contexts of the cases. Furthermore, through the focused interviews we gained additional in-depth information on the cases, which resulted in some modifications in the preliminary analysis.

4.2.1. Case selection

In this research, the design of the case-study follows Yin's (2003, p.40) embedded multiple-case design where the case context is suggested by the research topic: *value creation through novel social media and ICT-based approaches in networked environments*. This context is studied and analyzed with three different cases – Konecranes, xTune and Kaleva, which describe how crowdsourcing, swarm-work and gamification can be used to create value in three different value systems. The selected concepts are not mutually exclusive (as discussed in chapter 3), and thus the actual

cases build around the use context and one or several selected concepts (see table 4.1). The network perspective provides the embedded units for analysis: understanding value creation as a complex system requires insights from the transactions and exchanges of value between multiple network actors. Hence, the research setting supports the selection of multiple embedded units instead of one single unit (Yin 2003, pp.46–53). Still, the results in this research are discussed from the case organizations' perspective.

Table 4.1. *Case-study design*

Case	Crowdsourcing	Swarm-work	Gamification
Konecranes - GrabCAD Challenge	X		X
xTune		X	X
Kaleva - Innopinion Campaign	X		X

We used a multi-step process with multiple selection criteria for selecting the three different cases. Firstly, a large pool of different cases was gathered from SOILA-research project's databases and researchers. At this point the cases included both international and Finnish cases, and all of them had some linkage with social media or utilization of relatively new ICT based approaches. However, the case pool was gathered before setting the scope for this particular research and additional pruning had to be done.

Secondly, after formalizing the scope of this study and proportioning the thesis with other research tasks in the SOILA-project, we selected cases that were considered new and interesting especially from value creation and network perspectives. Novelty of the case was determined by mirroring cases with theory and other conducted case studies. More importantly we wanted to examine novel ways to create value in networked environments between multiple business actors and other stakeholders focusing on a systemic view of value creation and value capture. This excluded several cases that had been studied intensively before, such as GoldCorp challenge, IBM Innovation Jam, iStockphoto, Threadless, and many other cases with strong emphasis only on commercial sector. We acknowledged that all of the concepts in this thesis (i.e. crowdsourcing, gamification, and swarm-work) are not novel *per sé*, yet the novelty draws from various other aspects, such as involving community-based value co-creation between multiple actors in a value network, or intelligent ICT applications and software in enabling the effective implementation of the concepts.

Thirdly, in order to achieve the systemic perspective the cases had to be easy to access from multiple angles. This excluded cases that were not open enough for netnography (e.g. the case was only observable from single actor perspective). Also the cases with participating Finnish companies or organizations were seen easier to contact with for

further examination through interviews. Finally, we also wanted to include cases from various industries to show the diverse potential of novel value creation models. This excluded cases with same or too similar industries.

Considering these selection criteria we ended up choosing three different cases for this research. The first case, Konecranes GrabCAD Challenge, represents a novel community-based approach to co-create value through crowdsourcing complex engineering tasks in a traditional machinery industry. The second case, describes how swarm-work principles, with intelligent software and mobile tools, can be used to create value by enhancing and supporting business operations. The third case, Kaleva Innopinion Campaign, discusses how crowdsourcing with gamifying elements together with highly intelligent algorithms are used to create value in the media industry.

4.2.2. Conducting the netnography

We followed Kozinets' (2010, pp.60–61) general principles while conducting the netnography. Preliminarily we selected one online site for each case but during the data collection and analysis process we realized that some extensions to observed sites had to be made, so that all the relevant information could be gathered. Some of the sites needed registrations and/or special invitations. These invitations were obtained from the persons involved in the cases. Table 4.2 summarizes the selected sites for each case.

Table 4.2. *Cases and the selected online sites*

Case:	Selected online sites:
Konecranes GrabCAD Challenge	-http://grabcad.com/challenges/chain-wear-indicator -http://grabcad.com/ -GrabCAD Community – public profiles of participants -Workbench design tool (*registration needed*)
xTune	-http://intunex.fi/ -http://intunex.fi/xtune/ -Intunex Blog -xTune Hub for Sometu Community (*invitation and registration needed*)
Kaleva Innopinion Campaign	-http://www.innopinion.com/ -Innopinion Demo Campaign (*invitation needed*)

Data collection consisted of participant observation and focused interviews, as it was discussed earlier. Observations were conducted in online environments (i.e. on the online sites mentioned in the above table) separately for each case and before interviews. During the observations we adopted a covert role with both participatory and spectator-like elements (see Gill & Johnson 2010, p.167). Covert stance was

selected since the research setting aims at discovering general value creation mechanisms without focusing on individual users, and we presumed that notifying the users on the observed websites would have affected their behavior and led to unwanted distortions. During the observations we respected the privacy of the users – all the collected data was collected and stored in a way that the true identities of individual users were never compromised. This includes both textual data and screen captures. This way we can avoid some of the ethical issues related to netnography (see e.g. Maclaran & Catterall 2002, pp.323–324; Kozinets 2010, p.140).

The participatory elements included testing of online tools and services by ourselves. This was necessary so that we could analyze the mechanisms and tools that were present in some of the observed sites (e.g. GrabCAD Workbench, xTune tool, and Innopinion Demo Campaign). Testing of the tools resulted in deeper connection to the research subject as we were able to feel and experience the setting instead of just observing (Gill & Johnson 2010, p.161). During the observation we browsed through multi-form data including pictures, textual content and videos, and recorded our findings by copying textual content directly from the sites, taking screen captures of interesting findings, and making field-notes.

We also used focused interviews to complement the data gathered through observation. Importantly, observations worked as a pre-analysis of the cases for the interviews, as suggested by Merton and Kendall (1946, p.541). Interviews were conducted as semi-structured interviews focused around specific themes (see Appendix 1). The interviews were conducted in Finnish as all the interviewees were from Finnish companies. Interview themes with case-specific questions were sent to each interviewee a few days before the interviewing session. The sessions were conversation-like and included specifying questions and extensive discussions under each theme. The interviews lasted from 50 to 90 minutes, and they were recorded by taking notes during the sessions. In the end of the interviews we agreed on the specific arrangements for publishing the results. Table 4.3 summarizes the roles of the interviewees in the case.

Table 4.3. *Interviewees in relation with the cases*

Case:	Interviewees:	Organization:
Konecranes GrabCAD Challenge	Director, Business Unit Light Lifting	Konecranes
xTune	Founder and CEO	Intunex
	Sales & Marketing Manager, Implementation and project lead	Intunex
Kaleva Innopinion Campaign	Co-founder and CEO, Campaign coordinator and facilitator	Innopinion

The results of the netnography are discussed in detail in chapter 5. Before moving on to the results, we still need to examine the framework through which the collected data is analyzed.

4.3. Data analysis

In chapter 2 we outlined the current trends in value creation and paid special attention to the concept of smart business networks and their characteristics. We also introduced some well-known frameworks and models for analyzing value creation in networked environments. Mirroring the objectives of this study and the previously mentioned aspects of value creation in smart business networks, we adapted Biem's and Caswell's (2008) value network model as a data analysis framework. The selected model supports the required research scope to capture and document value creation mechanisms as they unfold in the cases.

Business entity analysis included listing of all the entities involved or relevant in the case, and viewing them through actor, asset and capability perspectives (Biem & Caswell 2008). The collected data is used as an evidence for the identified actors, assets, and capabilities, as well as the transactions and exchange of value in the network, in each case. Regarding both data collection methods, the analysis was conducted iteratively; first, a preliminary value network visualizations and actor analysis were produced from the findings of the participant observation, and after that they were modified as the collected data was complemented with findings from the interviews. During the process we used reasoning and deduction to correct and confirm our findings.

Notation for visualizing the value networks in the cases follows that of Biem's and Caswell's (2008) (see figure 4.3.). Notation consists of business entities, and the

supplies and outputs of different actors (i.e. the arrows with different color). The color coding for each in- and out-offerings is also presented in figure 4.3.

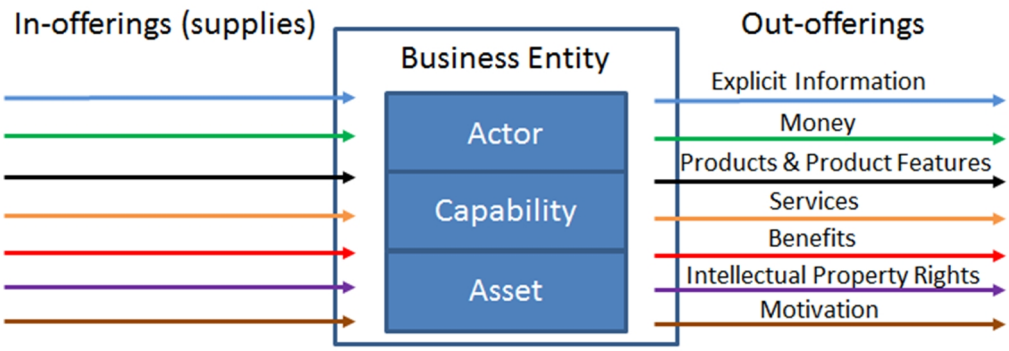

Figure 4.3. *Notation for value network visualization (adapted from Biem & Caswell 2008)*

Since the actual value creation happens inside the economic entity while transforming in-offerings into out-offerings, it is relevant to pay more attention to the transactions (i.e. arrows in the model) and their proportions. We recognize both intangible and tangible assets (Allee 2002, pp.3–4; Biem & Caswell 2008) possessed by the business entities and their contribution in enabling capabilities, which are the set of processes, activities and dynamics that are specific for the business entity (Biem & Caswell 2008). We adapted portions of both Allee's (2002) and Biem's and Caswell's (2008) value network models in order to define the required value transactions that suit the scope of this research.

Explicit information is information in digital written format and consists of comments, answers to questions, written documents and the like. Money represents the revenue flows in the model which usually consist of transaction payments and fees. Products and product features are physical or digital transferables where the ownership of the transferable is also transferred to the recipient (Biem & Caswell 2008). Typically these are the end products or modules of products. Services are out-offerings whose corresponding supplies (in-offerings) are given by the recipient, thus implying an exchange relationship between two or more parties (Biem & Caswell 2008). Traditionally service represents the company's offering and capabilities, and the customer pays the service provider in order to receive service. Benefits are intangible advantages or favors extending from one actor to another and they often reveal the true motivational factors for actors to engage in relationships (Allee 2002, pp.3–4). Benefits include trading favors and some other intangible advantages that can transfer in networks, such as brand awareness, sense of community and customer loyalty (Allee 2002, p.7; Biem & Caswell 2008). Intellectual property rights (IPR) is under intellectual property law and determines exclusive rights for the creator over his/her creation. IPR was included in the analysis as it is often seen as an issue in general with novel social

media based approaches (Kärkkäinen et al. 2012, p.134). Finally, motivation describes the motivational factors transferring in the value network. As it was stated these are somewhat related to benefits, and consist of intangible and tangible rewards, such as monetary rewards, reciprocity from the company, recognition, passion, and sense of obligation (Bengs 2012, pp.7–8). Motivational factors are not in focal point of this study, and thus our analysis only includes the most important motivational factors that are relevant in exchange mechanisms.

The selected model supports both descriptive and prescriptive (i.e. strategic) analysis. In this thesis we focus on the former since the purpose of this study is not to produce managerial insights or suggestive procedures for future actions on the selected cases, even though some of the findings may create fertile foundations for such work.

5. RESULTS AND ANALYSIS

This chapter focuses on the results gathered with the selected research methods. Each case is discussed separately in its own subchapter. Each chapter includes a short introduction to the cases, description of collected data, and analysis by using the analysis framework described in the previous chapter.

5.1. Konecranes – GrabCAD Challenge

Konecranes is globally a leading overhead crane manufacturer and service network provider. The company works in various industries serving customers such as manufacturing and process industries, shipyards, ports and terminals, and operates in 48 countries with over 12,000 employees. In 2012, Konecranes Group's sales totaled approximately 2,170.20 million euros[5]. Konecranes' business unit, namely Business Unit Light Lifting (BULL), decided to use GrabCAD's crowdsourcing platform to develop new indicator for chain wear in a chain hoist, which sets the base for our case in this research. BULL was established in the reformation of the structure of Business Area Equipment in the beginning of 2012.

GrabCAD is an online crowdsourcing platform which works around a CAD designer community of over 800,000 members and nearly 300,000 uploaded CAD designs[6]. GrabCAD Engineers (i.e. the members of the community) are, for example, freelancer designers, hobbyists, professionals, and students – practically anyone with Internet connection can register to the community. GrabCAD offers an open source CAD-library, a toolbox integrations for designers, a collaborative tool called Workbench, and competitions called GrabCAD Challenges. For some of these services a surcharge applies.

The case in this research focuses on Konecranes' Chain Wear Challenge which was held on GrabCAD's online platform between 30th of October 2012 and 15th of January 2013. Results of the design competition were published on 15th of February but the whole challenge is still accessible online[7]. Konecranes' Business Unit Light Lifting had an innovation and product development related issue concerning chain wear in a chain hoist. The challenge started with generating a specification together with GrabCAD to

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[5] According to Konecranes Company website (http://www.konecranes.com/)
[6] See http://grabcad.com/
[7] See http://grabcad.com/challenges/chain-wear-indicator

match these issues. At that time the rules of the competition were also published on the challenge web page. After that GrabCAD started promoting the challenge and took care of general hosting of the challenge on their platform. The competition gathered 44 solutions (some of them being private), and the best 6 entries were awarded with monetary and product prizes. It was possible to post multiple entries by a single GrabCAD Engineer but only one entry per engineer could be awarded. The jury, who decided the winners, consisted of Konecranes' and GrabCAD's employees. Konecranes selected and rewarded the top 3 winners with monetary prizes, and GrabCAD awarded the rest (4th, 5th, and 6th place) with GrabCAD T-shirts. The case involves examination of the challenge itself and interaction between participants in GrabCAD's online platform, and Konecranes' perspectives in relation with value creation in the value system.

5.1.1. Collected data

We collected our data with participant observation between 12.6. and 20.6 (in 2013) from the online platform, and an interview with Konecranes' Engineering director on 3rd of September. The interview lasted around 80 minutes and findings were gathered by taking notes during the interview. After the interview the results were gathered under a categorization generated earlier (see Appendix 1) and archived in digital format.

The participant observation required a registration to GrabCAD Community. We needed multiple sessions during the observation time to gather the relevant information. We examined generally the online crowdsourcing platform and its functions (e.g. GrabCAD homepage and blog); studied the Chain Wear Challenge web site; browsed through the profiles of each participant, downloaded all 44 entries (i.e. CAD models), and explored every post participants generated while publishing their entries.

In total we took nearly 280 screen captures and recorded approximately 980 separate lines of text. Screen captures were taken to record the general mechanisms and functions the platform contained. Screen captures were the easiest and fastest way to capture the functions as they appeared online. Textual captures included our field notes and information copied directly from the observed sites. Field notes were taken during a session where we tested the Workbench collaborative tool together with multiple researchers. Other text captures consisted of textual content on the sites (e.g. challenge rules, challenge specification, user agreements etc.) and comments left by participants and other community members. At the time of observation the total number of recorded comments (for separate entries or the challenge in general) was 242, and each entry gain 3.91 comments on average. The collected data was carefully stored and archived in digital format, and utilized in further analysis together with findings from the interview.

5.1.2. Value network analysis

We started our analysis by identifying the different business entities involved in Konecranes' case from the collected data. We discovered six important entities: GrabCAD Engineers, GrabCAD (the company), GrabCAD Partners, Konecranes Group, Konecranes Customers, and Konecranes Partners, from which Konecranes Group was divided into five additional units, as they each had their own agendas considering the case (see table 5.1). Business entities listed in the first column of the table are generalized and may thus represent a variety of different actors. Their roles are described in the actor column. We understand, for example, that there were multiple GrabCAD Engineers, with separate backgrounds, participating in the case: 34 individual designers published entries to the competition, and many more participated in the case by commenting other designers' works. The last two columns describe the relevant capabilities and assets of the different actors. If a certain cell in the table includes N/A, the information was either not available or not relevant considering the case.

Table 5.1. *Business entity analysis in Konecranes GrabCAD Challenge*

Business Entity	Actors	Capabilities	Assets
GrabCAD	- EIM	- Firm specific services and products - Business processes - Coordination	- Crowdsourcing platform - Community of GrabCAD Engineers - CAD library
GrabCAD Engineer	- Entrepreneurs - CAD designers - Professionals - Students - Freelance designers - Engineers - Hobbyists	- CAD designing - Innovating - Developing - Collaborating - Contacting	- Professional domain knowledge - Professional knowledge on using tools - Hardware and software
GrabCAD Partner	- Siemens Solid Edge - Autodesk AutoCAD - Luxion KeyShot	- Business processes - Integration services	- N/A
Konecranes Group	- Business Unit Light Lifting (technology owner)	- Business unit specific processes	- Professional domain knowledge

Business Entity	Actors	Capabilities	Assets
	- Service	- Business unit specific processes	- Professional domain knowledge - Customer knowledge
	- R & I	- Corporate level research and innovation functions	- Professional domain knowledge - Internal crowdsourcing platform
	- NPD unit (sprint owner)	- New product development processes	- Professional domain knowledge
	- Employee	- Personal tasks and functions	- Personal domain knowledge
Konecranes Customer	- N/A	- N/A	- N/A
Konecranes Partner	- N/A	- Business processes - Firm specific services and products	- N/A

Most of the capabilities and assets in the above table are quite straightforward but some of them require further explanation. We see that GrabCAD adopts the role of an electronic intermediary by offering digital services related to collaborative creation of CAD designs (Workbench-tool) and crowdsourcing them (open source CAD library and GrabCAD Challenges). In this specific case GrabCAD's role as a facilitator and coordinator between the CAD designer community and Konecranes is essential. Thus the community of CAD designers is considered as GrabCAD's asset. The community itself consists of GrabCAD engineers – the enthusiastic CAD designers from various industries. We found evidence on these community members having diverse backgrounds, including designers, students, hobbyists and CAD professionals working in other companies. Many of the users participating in Konecranes' challenge also openly stated that they have been working with similar issues before. Thus the GrabCAD engineers (all together) have a very heterogeneous knowledge base from different knowledge domains. Also some of the users openly shared in detail information about their hardware and software which they use for creating CAD designs. GrabCAD Partners, such as Autodesk and Luxion KeyShot, are related to the case through their integration services; GrabCAD's Workbench tool has several integrations with well-known CAD software.

Rest of the business entities are connected to the case through Konecranes. Konecranes is divided into 5 different units each of them holding important capabilities and assets considering the case. BULL is the technology owner; chain wear indicator is part of their product. Konecranes Service withholds the customer aspects delivering their needs and requirements to the case. R&I is the owner of the internal innovation challenge and the executor of innovation functions on the group level. Internal challenge was conducted at the same time as GrabCAD Challenge and with same specifications but in Konecranes' internal network. NPD Unit is the owner of the product development sprints. These sprints represent joint results of both internal and external challenges. At the time of the interview the case had already advanced to this phase. Some of the cells regarding Konecranes customers and partners are intentionally left blank due to confidential nature of the information. The relevance of these entities for the case unfolds in the value network analysis.

According to the selected value creation framework, the business entities form a working value system with turning certain in-offerings into out-offerings (i.e. creating and delivering value). During this process assets and capabilities of each business entity are in key position but also transaction and exchange relations between actors are required to comprehend value creation in the case network. The value network of Konecranes' case with identified value transactions are depicted in figure 5.1 by using the notation introduced in chapter 4. The white boxes with dashed lines (i.e. Chain Wear Challenge and Internal Challenge Platform) are part of GrabCAD and Konecranes R&I actors – Thus they are not business entities but online platforms in focal point of the case.

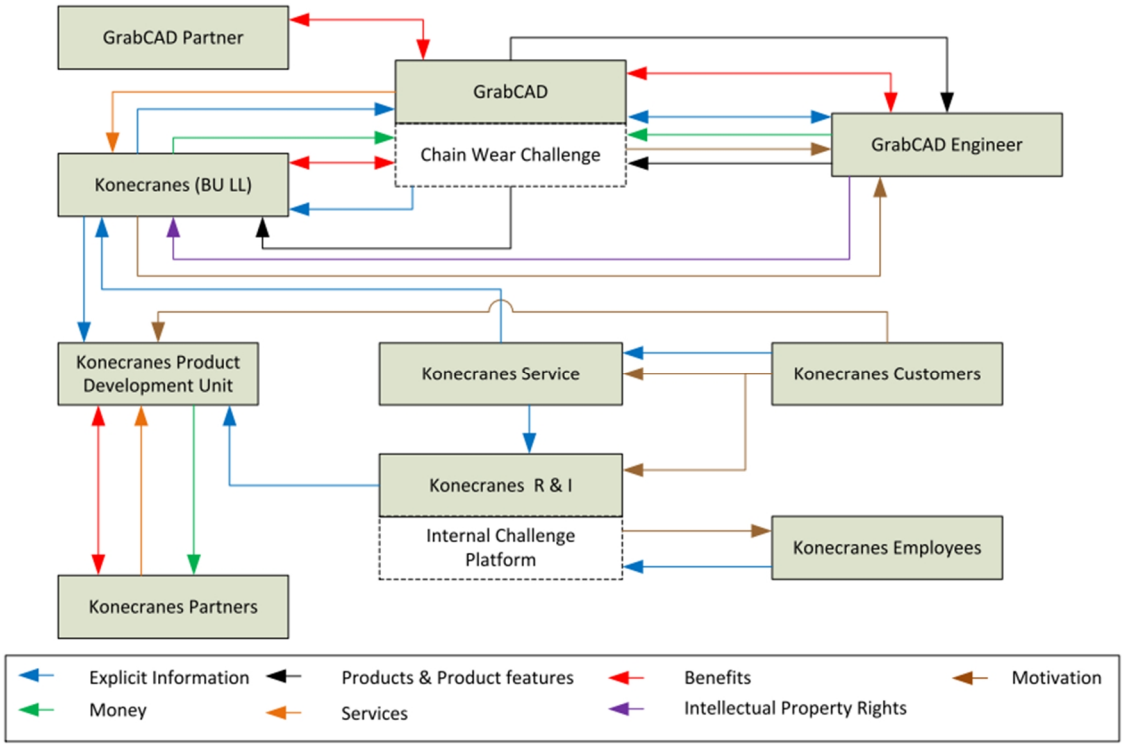

Figure 5.1. *Value network concerning Konecranes GrabCAD Challenge*

Fundamentally the case is about creating and delivering value by solving NPD and innovation related issues with crowdsourcing. Konecranes' vision for safer operating of cranes and customer needs articulated by Konecranes Service were the key drivers behind the challenge. There are three different phases: The first phase is the external crowdsourcing challenge hosted on GrabCAD's platform. The second phase is the same challenge executed internally parallel with the external one. The third phase is the integration of results from both challenges in order to proceed with the new product development project. All the seven types of value transactions (i.e. explicit information, money, products & product features, services, benefits, IPR, and motivation) were present in the value system.

By analyzing the first phase the value creation can be simplified to a simple process where Konecranes BULL paid for GrabCAD's services to gain access to the CAD designer community. Thus out-offerings of money and explicit information (i.e. the problem specification) were delivered to GrabCAD and in return after the challenge had finished BULL gained intellectual property rights for the published ideas directly from GrabCAD engineers and the actual CAD files (digital products or product features), and their specifications (explicit information) together with the final report through GrabCAD's platform. In addition, we see BULL and GrabCAD mutually benefitting from the challenge – both organizations gain for example brand awareness and visibility through the public competition.

During the challenge BULL also motivated the external participants with monetary prizes ($6,000 in total) and offering an interesting context for design tasks; we found comments from participants where they specifically praised the challenge specification and time scope following with intentions to participate. GrabCAD also takes care of its community by offering other prizes for winners (i.e. GrabCAD T-Shirts), and promoting GrabCAD Engineers in their blog posts. In addition, collaboration and the support of the community can be seen as a motivational factor; designers get recognition among other designers and GrabCAD platform collects user related and contribution related information about the users which is used to give credits and badges for active participants. Mutual benefits between designers and GrabCAD are also quite self-evident: After registration designers get access to the open CAD library where any designer can create their portfolios or use other designs as inspiration. GrabCAD also offers chargeable services for designers (e.g. the Workbench-tool, and toolbox integrations) but we found no evidence of using these in this specific case. Practically the tool enables near to real time collaboration and co-creation of CAD designs between multiple users.

The internal challenge was executed by R&I. Konecranes' employees could voluntarily give their ideas to the challenge. Certain game elements were used to motivate participation but the number of solutions gained was lower than in the public challenge. Key drivers behind the internal challenge sprang from the vision and customer needs. Mostly the internal challenge resulted in transactions where explicit information was transferred (e.g. comments and ideas in written digital format).

The third phase integrates the results from both challenges. Firstly, a NPD unit with the needed professionals and competences was established. Secondly the results of both challenges were assessed and discussed. At this point the winners of the public challenge were remunerated. Three best 'ideas' were chosen for further examination, and they were developed parallel in sprints by the NPD unit. Thus the NPD unit gained the modified and refined results of the challenges as inputs. Some sprints also use traditional outsourcing (Konecranes Partners) in the process; Konecranes pays money for the services of their partners, and both parties gain mutual benefits, such as brand awareness. The development process of the chain wear indicator is still active, and we can only estimate that eventually the results of the challenges are (in some way or another) implemented in the actual product – the chain hoist.

According to our findings the value transactions in the value system were delivered mostly through the crowdsourcing platform. The platform had social functionalities which enabled collaboration and interaction between different actors – most of this was between GrabCAD Engineers and in form of commenting the posted entries. Moreover the platform was also used to deliver and articulate the results of the challenge; winning engineers were remunerated, and the results and end reports were delivered to

Konecranes BULL. During our observation we also found out that other social media besides the challenge platform (e.g. Facebook, Twitter, and GrabCAD Blog) were used in promotional purposes. During the competition, however, these media were of minor significance, and GrabCAD Engineers preferred challenge platform's own 'liking' and connecting activities over Twitter and Facebook shares.

During the interview we spent a lot of time discussing also the relevancy of crowdsourcing in value creation, and its benefits. In Konecranes' case crowdsourcing turned out to be very beneficial model for gathering ideas for new product development. BULL was also lacking the resources to internally handle the front end of the innovation process; thus it was more about deciding to start the project now by using GrabCAD or delaying the process or not doing it at all. Interviewee estimated that GrabCAD challenge cost about half of the sum needed to do the same internally. This is, however, hard to measure – how can one for example measure the time required to come up with an innovative solution? The results of the public challenge were also of good quality – at least the same quality, often better, than the solutions in internal challenge. Other benefits included "*fresh opinions from heterogeneous crowds*" and positive brand awareness and publicity while everything was openly discussed in public. Konecranes also saw GrabCAD's role as a mediator important; BULL could guide the process in right direction by modifying the challenge specification slightly during the challenge through GrabCAD. In the end, all the transactions of the external challenge, except IPR, were transmitted through GrabCAD's platform, and Konecranes needed not to spend significantly resources for doing so.

Interviewee also emphasized that GrabCAD Challenge worked 'on the idea level' in their case. Practically not a single solution was usable itself – even though the received CAD models looked ready, Konecranes still had to assess the used materials, and test and verify the models. Interviewee also believed that crowdsourcing approach is not applicable for every organization; a right kind of culture and maturity is required to make the implementation possible. Some organizations may also see the publicity as a disadvantage; most likely competitors can see what kind of problems or issues a company is dealing with. Moreover, if the results of a crowdsourcing challenge are openly accessible, what prevents the competitors from focusing on the same solution? This was, however, not the case in Konecranes' case, as BULL saw measuring the chain wear as a minor part of their product and no competitive advantage is believed to be lost. Also, interviewee supposed that even if competitors saw the same results they may lack certain infrastructure, maturity or capabilities to refine the ideas to workable end-products – crowdsourcing only enabled gathering of ideas and not readily employable products.

5.2. xTune – supporting business operations

Intunex is a Finnish company established in 2008. Intunex' business operates around an innovative software tool called xTune, which helps experts to solve challenges of today's dynamic working environments. xTune is a social business application making it easier to share and connect expertise inside and between organizations. xTune's innovativeness is based on the concept of swarm-work and certain game elements enhancing participation and motivation while using the software. In general xTune fits best knowledge intensive organizations with, high expertise, over 100 employees and distributed business operations.

The case focuses on xTune application and discusses its functionality and their effect in business operations and users. In general motivation for implementing xTune comes from the need to enhance competencies and expertise management practices inside the company. The issues include for example difficulties in finding the right talent and competencies, sharing of workload between employees, and challenges in knowledge sharing and communication. Thus, xTune is believed to help in resolving these issues, and prevents 'inventing the wheel over and over again' in everyday business functions. The case brings insights from xTune supplier's perspective from various industries.

5.2.1. Collected data

We collected our data with participant observation between 24.6. and 27.6 (in 2013) from the online sites, and tested xTune application in Sometu community on 20th of August. In addition we conducted two interviews: the first with the founder and CEO of Intunex was held on 2nd of October, and the second with Intunex' Sales and Marketing Manager on 29th of October.

The participant observation included examination of Intunex' web sites, their blog, and xTune web sites. This was mostly done for familiarizing ourselves with Intunex and xTune so that we could understand the application and its utilization better. During the observation we also found many interesting research articles which were used as a reference in blog texts, and they were worth exploring. By browsing the sites we also found out the Sometu community[8] where xTune was already installed and used. Since xTune is often integrated within organization's systems, a public access is hard to obtain, and thus we decided to test the actual application in Sometu community. This way we could test the application and its functions by ourselves.

During both observations we collected around 1180 individual lines of text and took 70 screen captures. In addition, we watched online videos uploaded on observed web sites.

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[8] See http://sometu.ning.com/

The textual content consisted mostly of blog posts, questions and answers (i.e. Frequently Asked Questions), and our field notes. The field notes were taken while testing xTune, and other content was recorded from the first observation on Intunex' sites. The screen captures were taken to record the testing session of xTune in Sometu's xTune site. A registration to the community and an invitation to use the xTune application were required prior the observation. Screen captures and field notes, regarding Sometu's community, were only used to record the functionalities and working mechanisms of xTune, and they contain no specific or personal details of community members or the contents of the community as they were irrelevant considering this study. The collected data was carefully stored and archived in digital format.

The observations conducted were essential for capturing some general, and publicly available, information on xTune, but considering the case we required more in depth information from using the application in our case organization. Thus we also conducted two interviews. The first interview with Intunex offered a service and application provider's perspectives to the case, while the second interview focused more in actual user experiences and current situation of the pilot inside the case organization. Interviews lasted from 50 to 70 minutes and notes were taken during the interviewing sessions. These notes were reflected and archived in digital form right after the interviews, and used together with the findings from the observation in further analysis of the case.

5.2.2. Value network analysis

Just like in the previous case, the analysis started with identification of business entities involved in xTune case. However, in this case the mapping of different business entities is built on Intunex' experiences and use cases from various industries, and not around one specific company or organization. We identified five important business entities which form the value system of the case. These entities are: Intunex, company, stakeholders, LinkedIn and Wikipedia, from which the company was further divided into three actors based on organizational responsibilities or functions these actors may hold (i.e. HR, business unit 1 and business unit 2). The results together with actor roles, their capabilities and assets, are presented in table 5.2. If a certain cell in the table includes N/A, the information was either not available or not relevant regarding the case.

Table 5.2. *Business entity analysis in xTune case*

Business Entity	Actors	Capabilities	Assets
Intunex	- Social application and consultancy provider	- Firm specific services and products - Business processes - Coordination and user training	- Professional domain knowledge
Company	- HR	- Business unit specific processes	- Professional domain knowledge
	- Business Unit 1	- Business unit specific processes -Tasks and activities	- Professional domain knowledge
	- Business Unit 2	- Business unit specific processes -Tasks and activities	- Professional domain knowledge
Stakeholder	- Customer - Partner - Supplier	- N/A	- Professional domain knowledge
LinkedIn	- EIM	- Social networking services - Recruiting services - Coordination	- Social networking web-site - User and company profiles - User generated content
Wikipedia	- Online encyclopedia provider	- Administration - Coordination	- Internet encyclopedia - User generated content

Considering the case Intunex acts in a role of service and application provider offering several services regarding their key software product – xTune. These services include for example implementation and integration services, as well as user training and coordination. Coordination consists of community management activities especially in the early phases of xTune implementation. Intunex' key asset is professional domain knowledge, especially in the areas of swarm-work, collaboration and social applications.

The company represents the organization where xTune application can be implemented. The users are company's employees working in different business units. The interviewees argue that xTune enables organization-wide interaction and collaboration of individual users, but it can also be seen as a HR tool. Thus we ended up adding HR

as an individual actor for our analysis in addition to other business units (e.g. sales, marketing and product development). Initially the motive for implementing xTune stems from these actors and interaction between them. Thus, they are in focal point of the case. Each actor, including their employees, has professional and personal knowledge attached to business processes and tasks they are performing. For example the knowledge and competencies of sales personnel may significantly differ from those of persons working in product development unit.

Interestingly the case also involves external entities, namely LinkedIn and Wikipedia. LinkedIn is a social networking web site which offers services for professional networking and recruiting. LinkedIn users can publish and share up-to date profiles as resumes with relevant skills, expertise, and education and working details. Wikipedia is a well-known online encyclopedia based on collaborative content creation. This means that contents of the encyclopedia are user generated and evaluated. Some of the digital services these actors provide are integrated in xTune by using open interfaces.

During the interviews we also discussed some other external actors and their role in xTune implementations. However, without a special use context the collected data provided only general information of different roles of the stakeholders (e.g. customers, partners and suppliers) and the professional domains of knowledge they may have. These matters are discussed later on in our analysis from the value system perspective.

By using the data analysis framework introduced in chapter 4, we formed a visualization of the working value system regarding the xTune case (see figure 5.2). The figure consists of value transactions and value exchange between the aforementioned business entities and actors. In this process the capabilities and assets of each actor are in key position for comprehending value creation in the case network. xTune Hub, depicted in the figure below the company actor, is not an actual actor but otherwise in focal point of this case. It represents the implemented xTune application which can be seen as the technological solution for enabling transactions.

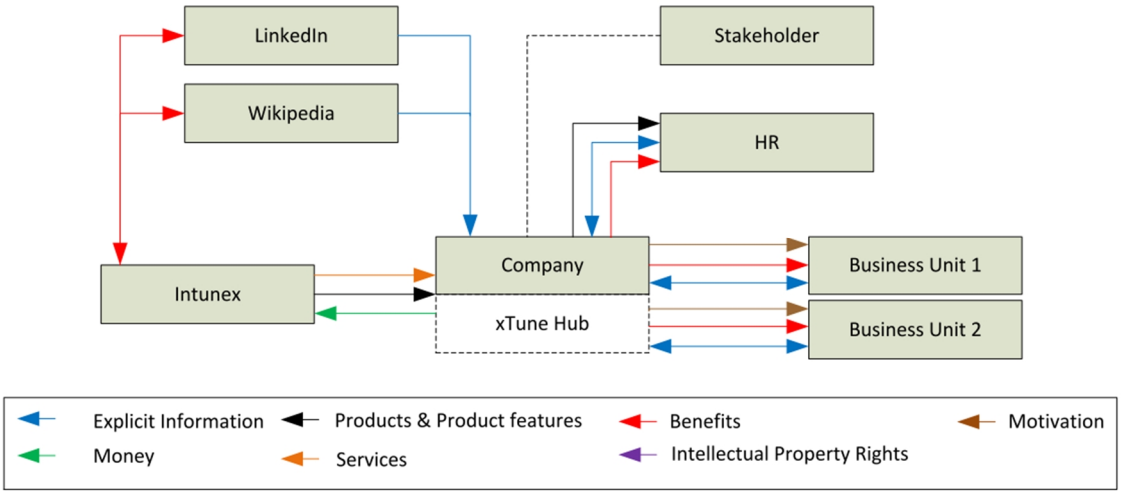

Figure 5.2. *Value network concerning the xTune case*

Fundamentally the case is about enhancing companies' and organizations' internal communication and competency and expertise management practices. Regarding this swarm-work and xTune are in focal point: Swarm-work principles and practices are delivered by xTune software. This potentially adds value in general to the business practices of an organization implementing xTune. We identified six different value transaction types regarding the case: Explicit information, products & product features, money, services, benefits, and motivation. Only intellectual property rights were absent. This is quite understandable as the case involves mostly company internal actors and everyday activities while conducting business. Thus, IPR issues do not appear as relevant for this case. Suggested by the collected data further analysis can be divided into two sections: The first section discusses the xTune software and the possibilities it enables, and the second concludes how the value is created and exchanged with xTune in business operations in general.

According to our observations and the interviews xTune is a social application providing the necessary technical solutions and social environment for swarm-work. It enables collaboration between multiple users in a swarm-like formation based on competencies, skills and the interests of users. xTune is a hub-like digital platform where users can freely start projects, present ideas, share problems and answers, comment and discuss on started topics. Every time a new project (or idea, problem, or other topic) is started, xTune asks which competencies and skills are relevant or required for the new topic. Based on the user selections xTune automatically suggests the users with the right skills and interests to join the project. In order to do this, xTune keeps track of all the users and their personal details, as well as the skills and competencies they have added to the user profiles. Moreover, xTune has certain in-built game mechanisms that motivate users. Participation and helping others are recognized and rewarded with points, and most active users are presented on leaderboards. The second interviewee argues that in addition to the aforementioned functions xTune has a

wide variety of functionality, including staff training, team and personal goals, and intelligent search functions, that can be used to support especially HR operations of an organization.

According to the first interviewee the collaboration model behind xTune is not new per se; same models and behavior (e.g. casually asking help from co-workers in work related tasks) are often present in "*shadow organizations*" and informal processes in businesses and organizations. Also other recently emerged social tools and social networking tools activate swarming around common topics. Most of the time, the benefits and outcomes in these cases are lost in the noise or based on serendipity rather than logic. The first interviewee concludes that swarming and swarm-work are effective ways of working, and xTune as a technology is designed to support them by increasing the logic rather than chance behind activities, and making the whole easier to manage.

The second section offers insights and analysis how the utilization of xTune is connected to the value system of company's internal business operations (figure 5.2.). Transactions between Intunex and the company implementing xTune include services, products and money. The exchange of transactions is rather traditional: Intunex offers the xTune application, and implementation, integration and user training services for a monetary payment generating a normal supplier-customer relationship. Implementing xTune includes installation of the software and possible integrations with other information systems.

Since xTune uses open interfaces from LinkedIn and Wikipedia, transactions between these parties also exist. Transactions from LinkedIn and Wikipedia consist of explicit information. Regarding LinkedIn this information consists of public profiles of employees, and in Wikipedia's case it is the skill and competency descriptions users have created and published in Wikipedia. In both cases xTune automatically (if wanted) retrieves the information and uses them as basis for further modifications to meet the user or company preferences. According to the second interviewee LinkedIn and Wikipedia integrations are very useful and speed up the integration processes. Moreover, in general it is not rare that employees as sophisticated LinkedIn users have more information displayed in their LinkedIn profiles than in employer's systems. The utilization of the aforementioned open interfaces produces mutual benefits between Intunex, LinkedIn, and Wikipedia – Intunex gains access to valuable public content and can use this content as part of their product, and these benefits are also delivered to the company during the implementation. LinkedIn and Wikipedia gain free promotion for their services (e.g. increase in the number of LinkedIn users) and brand awareness.

According to our findings, the most transactions occur between different employees and business units internally. These transactions are mainly intangible consisting of transactions such as explicit information, motivation and benefits, but also some

tangible transactions, such as digital products or product features were identified. The interviewees argue that even though xTune is providing the technological platform for delivering the transactions, different users from various business units, and their interaction and behavior while using xTune, are in vital role of any xTune case. According to the interviewees appointing a steering group can be helpful in activating users especially in the early phases of xTune implementations. Steering groups can also be essential in delivering the required user trainings and generating valuable examples and positive experiences for other xTune users.

The utilization of xTune provokes exchange of explicit information in form of adding personal details, profiles, skills, and competencies to the digital platform, but also publishing new topics, projects and problems in xTune (i.e. creating swarms). In addition posting comments, answers, and sharing ideas in swarms are considered as transactions of explicit information. All this information is recorded in xTune. The actual use cases – the swarms – are highly context-bound and different for every organization as they relate to everyday business operations. Creating swarms can be rather practical and involve for example asking help from co-workers and solving everyday problems on ad-hoc basis. Potentially xTune's game mechanisms and helping others in general motivate users to continue sharing of information via xTune.

According to the collected data, xTune can also enables interaction between external stakeholders such as customers, partners and suppliers. However, according to the first interviewee there is some demand for external connections on the grass root level but wider examples of external collaboration are still rare. These potential connections are depicted in figure 5.2 with dashed line.

According to the interviews, the utilization of xTune has great potential in delivering a variety of benefits for users and businesses in general. These benefits are often different for different user groups (i.e. business units and HR). The second interviewee argued that the main idea in using xTune from end-user perspective is to make communication, knowledge sharing and problem solving more transparent. Effective search mechanisms and automatic suggestions based on skills and competencies help to find the right skills faster. In some cases the problem might be already solved in another swarm, and thus solution may be found instantly. In addition, swarming based on self-organizing activities divides workloads evenly and offers employees various ways to contribute. The first interviewee argued that even if you are only "*lurking*" (i.e. watching how other people contribute) in a swarm, you can still learn from the activities of others.

According to the interviews, xTune's benefits from HR management perspective are related to the recorded competencies and skills. Essentially xTune helps to form a realistic picture of the competencies and skills employees have. Thus, fully implemented and utilized xTune helps to map the competencies company wide. This

information can be imported from xTune for example as Microsoft Excel files, and used for further analysis and development of human resources (e.g. staff trainings and recruiting).

During the interviews we also discussed of some of the issues xTune implementations and utilizations, or swarm-work in general may generate. The first interviewee argued that even though xTune as a technology is innovative and enables effective functions for sharing competencies and knowledge, much of the benefits depend on the actual utilization. If xTune is not used and integrated with right processes, the potential benefits also diminish. Identifying the right processes is, however, challenging. Also there are several challenges in motivating and changing practices and human behavior (i.e. organizational culture) in general.

5.3. Kaleva – Innopinion Campaign

Kaleva is a Finnish media company offering various services and products including digital and printed media, and delivery and printing services. Kaleva's main product is Kaleva-magazine which is also the most popular printed news medium in the company's operating area (i.e. Northern Finland). In 2012 Kaleva's revenue totaled in 62.7 million euros, and the company employs over 520 persons[9]. Kaleva focuses on the future by constantly developing its products and services to match the changing requirements of customers. Development includes collaborative functions of multiple shareholders. This sets the premises for our third case; Kaleva used Innopinion campaign to gather information and ideas from customers and companies to guide Kaleva's service development in the right direction.

Innopinion is a company offering a service for collecting and managing ideas and feedback from crowds. The service is a namesake of the company (Innopinion) and it includes organizing a promotional challenge which activates and motivates customers' stakeholders to contribute or engage in product and service development process. The challenges work around personalized and gamified tasks send to different users via email; contribution includes giving at least a single new idea or an opinion to an idea given earlier, and participation is awarded with credits. Innopinion campaign processes ideas automatically with certain criteria and refines the given ideas with other's contributions. In the end of the campaign Innopinion produces a report to the client with all the contributions and refined ideas, and the best participants can be rewarded.

The case focuses on Kaleva's Innopinion campaign held in March 2013, where the objective was to gather information and ideas from Kaleva's customers, partners, subcontractors and advertisers operating in Northern Finland to guide the service

[9] According to http://www.kalevakonserni.fi/

development process. The idea behind the campaign is to develop new digital media services that really match the general requirements of Kaleva's customers. The campaign was open for everyone and required a registration. The case examines both Innopinion's and Kaleva's perspectives, as well as the interactions between participants in the campaign.

5.3.1. Collected data

The observation on Innopinion's website was carried out between 23.6. and 26.6. (in 2013), and we also took part in an Innopinion demo campaign which requires an invitation from a participant. We participated and observed the campaign via emails between 3.6. and 8.9. Typically we received one email per day and a weekly report at the end of each week. These emails included all the information needed to participate in a campaign, some personal statistics, and statistics for the whole campaign, such as number of ratings and gathered ideas, leaderboards, credits and number of participants. The demo campaign's mechanisms are similar to the Kaleva's Innopinion campaign, even though the actual campaign also has functionalities not present in the demo campaign.

In total we gathered nearly 20 screen captures and over 3000 separate lines of text. Screen captures were taken to record the actual participation in the campaign. The textual captures consisted of general content of Innopinion's web site (e.g. help and frequently asked questions), and emails recorded during the campaign. This data helped us essentially to form a comprehensive picture about Innopinion campaigns and its mechanisms.

However, studying merely the campaign mechanisms is not sufficient to discover the potential of Innopinion campaigns in value creation. Moreover, the actual campaign Kaleva held in March, was no longer publicly accessible, so we needed to gather the relevant information with an interview. The interview was conducted on 2nd of October and it generated us in-depth knowledge about the case. The interview lasted around 80 minutes and the notes collected during the interview were recorded and archived in digital form together with the collected data from the observations.

5.3.2. Value network analysis

Just like the previously described cases, also Kaleva's Innopinion campaign formed a network with multiple business entities (see table 5.3). Each of these entities has specific roles in the case and withholds important assets and capabilities to contribute in the value system. We identified four different entities: Innopinion, Kaleva media house, Kaleva's partners, and Kaleva's end-customers. From these entities it was purposeful to divide Kaleva into two different actors (i.e. the company and employees), and Kaleva's partners into two different actors (i.e. subcontractors and advertisers) due to their

separate roles in the case. Relevant capabilities and assets of these actors are also presented in the table. If a certain cell in the table includes N/A, the information was either not available or not relevant regarding the case.

Table 5.3. *Business entity analysis in Kaleva – Innopinion case*

Business Entity	Actors	Capabilities	Assets
Innopinion	- Service provider - EIM	- Firm specific services and products - Business processes - Coordination	- Innopinion campaign engine (software and hardware) - Professional domain knowledge
Kaleva - Media house	- The company (campaign owner)	- Business specific processes - New service development activities -Campaign promotion	- Professional domain knowledge - Stakeholders
	- Employee - Manager	- Personal tasks and functions - Decision making	- Personal domain knowledge
Kaleva's partners	- Subcontractor / potential subcontractor	- Business specific processes	- N/A
	- Advertiser	- Business specific processes	- N/A
Kaleva's end-customer	- Reader - User	- Personal tasks and functions - User behavior	- Personal domain knowledge

According to the collected data, Innopinion is in the role of a service provider. Their services include coordinating and running of Innopinion campaigns and the necessary software and hardware to operate them. The actual campaigns and their functionalities closely resemble those of electronic intermediaries; campaigns work in between the crowds and campaign owners by offering the digital operating environment and processing the interaction and contribution of the crowd. Innopinion's key assets considering the case include professional domain knowledge especially in the areas of gamification, collaboration and customer engagement.

The media house Kaleva owns the campaign in our case; the campaign is aimed to Kaleva's stakeholders and designed to support the company's new service development

process. Key assets regarding Kaleva as a company include the stakeholders (e.g. customers, subcontractors, and advertisers), and professional knowledge especially from the areas of printed and digital media. Capabilities include normal business processes, new service development functions and campaign promoting activities. Also Kaleva's employees are in focal point of the case; personnel have their own knowledge domains, tasks and activities based on their positions in the company. Staff members also participated in the Innopinion campaign, and eventually also managers involved in the case with decision making capabilities.

Kaleva's partners include both current and potential subcontractors and advertisers. The interviewee argued that these stakeholders are in key position considering the whole campaign. Involving current and potential subcontractors and advertisers in the campaign enables gaining of in-depth knowledge from various professional knowledge domains which can be used to assess the quality and feasibility of ideas in the campaign. For example, subcontractors may have important insights on technical features regarding new ideas.

Kaleva's end customers are the ordinary people reading Kaleva's printed or digital media. We identified two actors – readers and users – from which readers refer to people who read printed media, while users refer to digital service consumers or other users that took part in the campaign. However, in general the readers and users represent the *crowd* participating in the campaign. Importantly, the crowd possesses heterogeneous personal knowledge, user preferences and capabilities that offer valuable insights regarding the case.

By using the data analysis framework introduced in chapter 4, we formed a visualization of the working value system regarding Kaleva's Innopinion campaign case (see figure 5.3). The figure consists of in- and out-offerings (i.e. value transactions) of different business entities and actors introduced earlier. The capabilities and assets of each actor are in key position when analyzing the transactions but also the exchange of value is required for comprehending value creation in the case network. Innopinion Campaign, depicted in the figure below Innopinion, is not an actual actor but otherwise in focal point of this case. It represents the digital campaign platform which can be seen as the technological solution for enabling transactions in the value system.

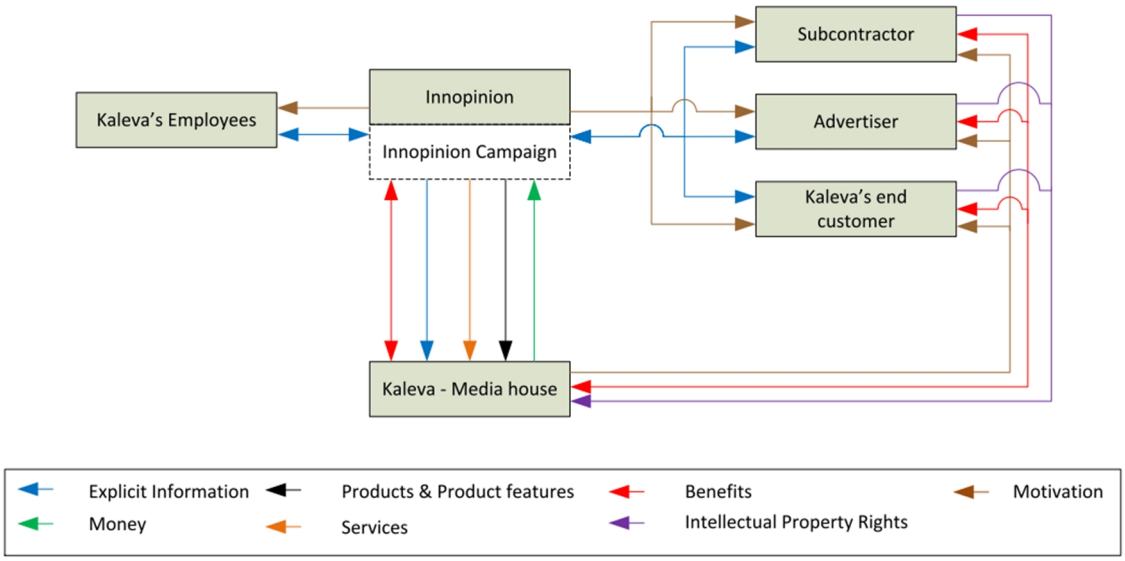

Figure 5.3. *Value network concerning Kaleva – Innopinion Campaign*

Fundamentally the case is about using crowds and crowdsourcing together with a gamified digital campaign platform in developing new digital service media for Kaleva media house. The purposes behind the development process are to provide services that meet the changing user requirements and deliver new value. The case study settles in the front end of new service development process, including ideation phases and feasibility assessments. From the collected data we identified transactions between all the aforementioned business entities and from all the seven transaction types. Suggested by the collected data, the case can be divided into two sections: The first section discusses the Innopinion campaign in detail, and the second section focuses on the utilization of the campaign platform in Kaleva's new service development process.

According the conducted observation and interview, Innopinion campaign platform is the technology enabling the transactions in the case network, and thus very vital in Kaleva's case. The digital campaign platform represents a unique model for crowdsourcing and engaging users online. Mechanisms include for example game elements, such as leaderboards, rewarding, points, badges, personalized tasks, feedback, and progress; intelligent analytics and algorithms for processing the campaign data; and funnel like design. In practice, Innopinion campaigns work through emails; after the campaign has been created in collaboration with the campaign owner, email invitations are sent to different users (e.g. customers, partners and other stakeholders) who can accept them. Invitations work as simple registrations where users can fill in some personal details. After that, rest of the campaign and participation works through emails without logins or registrations to web sites.

Innopinion campaigns send personalized emails with tasks and campaign statistics. Tasks are generated from the ideas other users have created, and sent only to participators that are most relevant for solving it (based on the personal information and

previous actions in the campaign). Participators can also send in new ideas and invite more users any time. User activity is rewarded and statistics in each email show the personal progress and overall campaign statistics. The campaign engine ensures that all the ideas will be evaluated thoroughly from various perspectives (e.g. the quality of the idea and urgency for implementing it) by many users, and thus at the end of the campaign all the ideas are comparable.

According to the collected data, Innopinion campaigns work as a smart tool for attracting and engaging current and new customers who share a common interest by gathering ideas, feedback, opinions, and personal details systematically and in a motivating way. The interviewee argued that the technical elements, from which the campaign consists of, are not novel. For example, game elements and email marketing have been used before in various contexts, but combining them with a highly intelligent campaign engine discloses the novelty and benefits of the model. Also the way of handling stakeholders or participants during the campaign is innovative: complex algorithms are used to select the best possible user for the task. The interviewee argues that in a way such a model is not open like many other crowdsourcing models: "*The power is taken away from the crowd*", and replaced with artificial intelligence – the campaign engine.

The second section is focused on how the Innopinion campaign was utilized in Kaleva's new digital service development process. According to our analysis (see figure 5.3.) Innopinion forms a traditional supplier-customer relationship with Kaleva but the campaign platform can be seen more like an electronic intermediary in this case. Exchange of services and monetary payment occurs between Innopinion and Kaleva. Innopinion's services include designing and running of Kaleva's campaign. After the design phase, the actual digital campaign platform automatically takes care of the interaction between different stakeholders, and processes the gathered ideas. Basically Kaleva's role in running the campaign only included taking part in the design phase, promoting the campaign through their media, and deciding the future actions after the campaign.

The design phase included collaboration between Innopinion and Kaleva; a standard list of different categories working as rules for the campaign formed a starting point. Kaleva carefully decided the campaign rules which would be used as input for the campaign engine and algorithms. Also the landing pages, prizes and campaign features were modified to meet Kaleva's brand. After the design phase Kaleva also provided a list of customers and partners that would be invited to take part in the campaign.

Kaleva's campaign was designed in a way that different stakeholders were involved in the campaign at different times. At first, Kaleva's employees and end-users created ideas and assessed them. At this point campaign gathered a lot of new digital service

media ideas and Kaleva could also test the market potential for their own ideas. These ideas evolved according the user actions and opinions in the campaign funnel but in general they essentially brought forward the insights of users. In the above figure the gathering and assessing of ideas involves exchange of explicit information between the campaign platform and different stakeholders. The platform also constantly motivates participants with game elements.

As the campaign matured, current and potential subcontractors involved to the process by sending in their own ideas, and offering important insights on evaluation (e.g. technical feasibility) of all the ideas that had passed public levels. At this point also the advertisers brought their professional knowledge and effort to the campaign. According to our analysis the exchange of ideas and insight is in form of explicit information in the value system. Towards the end, the funnel tightens even more; ideas processed by the campaign engine represent the insights of all the participating stakeholders but in the end Kaleva's employees and managers had to decide which ideas could be carried out from the strategic perspective. After the campaign had finished, Kaleva awarded the most active participators with small tokens (e.g. movie tickets), and organized an idea workshop for the most active participants, where the concrete future development plans were discussed. In addition, all the IP rights for the ideas generated during the campaign transferred to Kaleva.

According to our analysis the digital campaign platform was either partially or fully involved in every exchange of transactions in the value system. As the campaign runs through emails, they were the most important channel for delivering the value. Regarding other delivery channels, the interviewee argued that social media usually has a promotional role in relation with the campaigns; both participants and the campaign owner can invite more people to campaigns or promote the campaign in social media channels.

According to the interviewee the campaign provided several benefits, even though the actual service development process has not yet finished. Thus, the benefits regarding new digital service ideas and their outcome are only potential at this point. Our analysis revealed mutual benefits (see figure 5.3) between Kaleva and all the external participators. Firstly, Innopinion campaign produced a lot of stakeholder information and statistics, which increased stakeholder understanding significantly. Also brand value, customer engagement and loyalty were affected positively. The interviewee also argued that campaign model generated considerable resource savings; usually coordinating such a large group of people with different motives and knowledge would require a lot of resources and time. With Innopinion campaign, Kaleva did not have to spend resources on coordinating the crowd as it was automatically done by the platform. In addition, managers did not have to browse through all the ideas and results; the

funnel like design together with the campaign engine pruned some ideas and made sure that the ideas popping out of the process were developed and matured.

Secondly, all the participants were delighted for being heard during the ideation process. In addition, the most active end-users received real prizes. Potential and current subcontractors gained also brand awareness and new business potential, as the future development of these ideas could lead to new business partnerships. Advertisers got a glimpse of the future digital services and could affect the development of those services from their perspective. Innopinion gained a positive reference and brand awareness after a successful campaign implementation. Moreover, practically every user could be seen as a potential new customer for Innopinion. Also, many users expressed their willingness to take part in some of the open or voluntary future campaigns.

6. DISCUSSION AND CONCLUSIONS

After viewing the results of the collected data we can move on to discuss their relevance regarding the purposes of this study. At first, we are going to outline the key findings stemming from the results of the theory and empiric parts of the study, and discuss the meaning of them in relation with the supporting research questions (see chapter 1) in this thesis. The research questions are highlighted as they unfold during the discussion phase. After that we conclude the research with a summarized answer to the problem statement, and by critically evaluating the conducted research. The evaluation consists of discussing the academic contribution and managerial implications of the study, and viewing the limitations of the research. Finally, we also suggest some important topics for future research.

6.1. Discussion

In the theory part of this thesis we explored how value creation has developed in congruence with the general economic and ICT developments. We shortly discussed the traditional economic theories of the 20th century (e.g. TCE, RBV and Porter's Value Chain) and described how perceiving the value changed as we approached to the 21st century. During this transformation the economic logic developed from goods-dominant to service-dominant (see Vargo et al. 2008), and the rise of the digital culture, the Internet and global digitalization (see e.g. Timmers 1999) caused fundamental changes to value creation. In this respect, we introduced Smart Business Networks (see Vervest et al. 2005; 2008; 2009), which according to our understanding is a concept withholding characteristics that embeds smartness in business operations and network activities that also reflect accurately the current trends in value creation (see more in chapter 2.3).

What are the current trends concerning value creation and value creation models in networks?

How do the studied value creation models differ from earlier models?

Through the above mentioned views, we identified the current trends in value creation, which differ greatly from more traditional approaches (e.g. G-D logic and value chain perspectives). Value creation has turned into a network activity where value is co-created with customers, partners and other stakeholders (Vargo et al. 2008, p.148). This includes dyadic value transactions between two different actors but also more complicated and decentralized exchange and co-creation of value with two or more

parties (see e.g. Allee 2002; Briggs 2009; Dijck & Nieborg 2009, p.863). Moreover, co-creation often happens on a demand-basis, meaning that different actors connect in value co-creation activities and disconnect when no longer needed (van Heck & Vervest 2007, p.30). The current view of value creation is also social context-bound; the activities, positions and roles of different actors affect the perception of value regarding a specific context or situation (Edvardsson et al. 2011, pp.336–337). The purposes for value creation include increasing adaptability, survivability and the wellbeing of the whole value system (Vargo et al. 2008, p.148). It is essential to understand that value creation is no longer embedded only in goods and services, or developed by enhancing and increasing their attributes, but customers continue co-creation through use by combining the market offerings of businesses with other private and public resources (ibid.). Thus, value is an experience consisting of the contribution of multiple network actors that can be materialized or realized in many ways. The importance of intangible assets and their effects on value creation during this process is also emphasized (Allee 2002).

What kinds of novel value creation approaches have emerged recently due to novel ICT-based approaches?

Even though SBNs as a concept may offer fertile environments for novel value creation through smartness and characteristics, we argue that the Internet and other ICT-based approaches are in essential role in enabling and facilitating it. Deliberately, and more increasingly, businesses and organizations are attempting to benefit and create value through novel business opportunities mostly enabled by the Internet technologies (Zott et al. 2011a, pp.7–11).In general, this kind of activity reflects eBusiness (see Holsapple & Singh 2000), for which Web 2.0 technologies and concepts are the most recent manifestation (see chapter 3).

In chapter 3 we shortly introduced several tools, applications and concepts that essentially build on Web 2.0 technologies. However, these are only a snapshot of the myriad number of different possibilities in implementing the recently emerged ICT-based approaches in business context. Providing these tools and applications as digital services (i.e. EIM) is but one way to gain business value but more essentially, we argue that many of the concepts can be seen as extensions of Enterprise 2.0, which refers to utilization of social software (i.e. Web 2.0 technologies) for supporting business operations in general (Mcafee 2006). Through this perspective, value creation based on Web 2.0 tools and concepts show great potential in integrating communities and individuals (i.e. Internet users) in value creation processes, which is in line with the aforementioned smart network approach (Goldman et al. 2009, pp.51–52). Within the scope of this study, we focused on exploring crowdsourcing, swarm-work and gamification related implementations and value creation. We see the selected concepts as novel ways to engage users, communities and crowds in business functions. Also,

they offer novel ways to benefit from collective intelligence and enable novel value creation approaches where the potential and benefits of social media and crowds can be captured.

How can aforementioned value creation models be analyzed and visualized?

The current understanding on value creation withholds strong linkages with network and systemic perspectives, which has to be taken into consideration while exploring novel value creation approaches. We discovered several models and frameworks with different purposes and scopes for visualizing and analyzing value creation in networked environments (see chapter 2.4). Some of the models emphasized business model perspectives (see e.g. Stabell & Fjeldstad 1998; Amit & Zott 2001) or specific elements (e.g. product or a service) of a business model (Briggs 2009), and others focused on mapping and visualizing the value network (see e.g. Gordijn et al. 2000; Allee 2002; Biem & Caswell 2008) or value creation in service systems (Vargo et al. 2008). Within the scope of this study, and acknowledging the recent development in the trends of value creation, we argue that an optimal value creation analysis framework should be able to analyze and visualize network actors and their resources and capabilities; relationships, value transactions and exchange mechanisms between different actors; and offer both descriptive and strategic views for developing the value systems. Assessing the explored frameworks with these requirements revealed some variation between different models. The biggest differences relate to framework's ability to visualize network actors and value transactions. In general, frameworks that specifically focus on mapping actors and value exchange between them (see e.g. Allee 2002; Weigand et al. 2007; Biem & Caswell 2008) performed best (in our assessment) for visualizing and analyzing the value systems.

In this study we sought further understanding on crowdsourcing, swarm-work and gamification related value creation by exploring the value systems in the selected cases with Biem's and Caswell's (2008) value network model. Through the case analysis we focused on finding the answers to the case specific research questions (see chapter 1.1). Thus, drawing from the collected data and our analysis, firstly, we wanted to explore what kind of value transactions and exchange of value occurred in each case. Secondly, by studying the transactions and exchange mechanisms between different actors we formed an overview of the working value systems in the studied networks. Finally, we also wanted to explore how social media and modern ICT contribute to value creation in each case.

What kinds of value transactions are there in the studied emerging value creation cases?

Regarding the transactions in the case value systems, we found out several interesting notions. Firstly, the used value network model distinguished seven different types of transactions: explicit information, money, products and product features, services, benefits, IPR, and motivation. As it was discussed in chapter 5, we found nearly all of them in each case network. Only IP rights were missing in xTune's case, which was only natural as the case withhold mostly company internal aspects. Acknowledging the case contexts, and that the transactions occurred mostly through digital platforms (i.e. GrabCAD challenge, xTune Hub, Innopinion campaign) we expected them to be intangible to a large extent. However, the value systems included also some transfer of tangible transactions.

Intangible transactions included information and knowledge flows (e.g. user comments, UGC content, user feedback and ideas), benefits (e.g. brand awareness, increased customer understanding and loyalty) and motivational factors (e.g. feedback, intangible rewarding and game elements). Tangible transactions included rather traditionally money (e.g. payments and subscription fees), physical and digital products (e.g. software and software installations, CAD-files) and motivational factors (e.g. prize money, movie tickets and GrabCAD T-shirts). These findings are similar to other previously introduced classifications (see e.g. Allee 2002, p.7) and in line with the general trend of increased emphasis on value creation through intangible transactions (see e.g. Teece 1998; Allee 2002; Allee 2008).

Secondly, proposed by the analysis, we argue that the value systems in the cases produce transactions for the primary cause of the case context but also some secondary transactions that complement and extend the cases. For example, Konecranes' case was essentially focusing on crowdsourcing new designs for chain wear indicator but in the end Konecranes also received other benefits such as brand awareness. Similarly, Kaleva received lots of ideas for new service development but also prospect partnerships, brand awareness and increased customer loyalty. In xTune's case, depending on the use context, xTune may enable flexible transfer of knowledge but also produce positive benefits for general organizational culture through transparency and openness. In addition, similar effects can be seen for other actors in the value systems.

Thirdly, regarding most transactions, capabilities and assets of an actor are in focal point in producing the transactions. For example, in Konecranes' case the link between GrabCAD engineer's capabilities and published entries is evident – GrabCAD engineers use their professional skills, knowledge and tools to create a suitable design for the challenge. However, we also distinguished transactions where the linkages between transactions and assets are vaguer. For example, many motivational factors are a result of more complicated exchange of different transactions and actor relationships in the value systems, and they cannot be determined by just viewing the capabilities and assets of an actor. In general, this advocates for more complicated perspective on generating

transactions through synergy effects, relationships, and platform capabilities that may not be visible while exploring just actor capabilities and assets.

How do the value transactions form a working value system in the studied networks?

More systemic analysis was required to reveal how separate transactions form a working value system in the studied networks. The value networks and analysis of the individual cases were presented in chapter 5. However, extending the views from separate cases into the broader research context generate several interesting topics that should be discussed.

Firstly, we argue that crowdsourcing and swarm-work create the foundations for the selected value systems on principle level (see chapter 3). Konecranes' and Kaleva's cases are examples of crowdsourcing implementations, and xTune represents a swarm-work application. In addition, we see that gamification and certain game elements are present in all of the cases in a secondary role. The secondary role includes enhancing and supporting the primary activities that largely reflect crowdsourcing and swarm-work principles. On functional level, we see that social media and other ICT applications are in fundamental role for enabling the interaction and activities, and thus, the delivery of value in the case networks.

Secondly, we argue that the value systems in the cases consist of not only dyadic exchange relationships but also more complex relationships between multiple network actors. Exchange of value occurs in form of value transactions where supplies are turned into out-offerings by utilizing the actor specific capabilities and assets (see Biem & Caswell 2008). Typical examples of dyadic exchange include for example traditional supplier-customer relationships – e.g. Kaleva pays money for the services of Innopinion. However, running an Innopinion campaign adds several other actors to the network, and thus more versatile exchanges occur. Similarly, Konecranes crowdsourcing effort enabled contribution of several other actors and co-creation between them. Thus the exchanges are not only chains of actions happening in a logical order but include more complex and dynamic transactions (e.g. one transaction is delivered to another actor and enhanced by a third) on demand-basis. The previous examples support the above mentioned views on the complexity of the value system.

Finally, by viewing the exchange of transaction in the value systems, we recognized actors that are in a central role in the cases. These actors are either third party service providers (i.e. GrabCAD or Innopinion) or more integrated digital platforms (i.e. xTune hub). These actors represent a typical example of an electronic intermediary. The role of the EIMs in the case networks is to coordinate and manage the collaborative activities and value transactions in the value system. This coordination can be realized in several ways. In Konecranes' case GrabCAD work as a community manager for GrabCAD

Community and the challenges offer a way to access the contributions of the community. In xTune's case the coordination efforts are highly self-organizing and realized by utilizing xTune application. Still, in this case, the contribution of the users is voluntary and based largely on personal interests. In Kaleva's case the campaign engine controls and manages the contribution of the crowds rather mechanically by using highly intelligence algorithms.

How do social media and modern ICT contribute to value creation in the studied pioneering value networks?

The last focus of the case studies was to explore the roles and contribution of social media and modern ICT for value creation in the studied value systems. Here, by social media we mean the Internet-based applications that allow the creation and exchange of user generated content, and build on technological foundations of Web 2.0 (Kaplan & Haenlein 2010, p.61), and modern ICT refers rather generally to other applications and systems where ICT is in key role (but do not necessarily count as social media) for, for example, providing additional value through unique use of algorithms or other functionalities. We argue that both perspectives are necessary for exploring the selected value systems, and the results propose a two-fold approach. Firstly, the digital platforms in focal point of the cases (i.e. GrabCAD challenge, xTune hub and Innopinion campaign engine) fulfill the above mentioned criteria and can be seen as social media and/or they otherwise reflect modernity and intelligence regarding the use of ICT. Secondly, the value systems benefit from the connections of other social media.

In Konecranes' and xTune's cases the digital platforms enable interactions and collaboration that can be viewed as social media. They benefit from Web 2.0 technologies and allow interaction of different users and sharing of UGC. As discussed earlier, the platforms are in vital role regarding the whole value system; they enable the collaboration and co-creation through their functionalities. Moreover, most of the transactions transferred through these platforms in the cases. However, Kaleva's case is rather different form the perspective of social media. The campaign mechanism works with emails, and thus the case is not about social media from this perspective. Still, the digital platform controls and manages the collaboration constantly during the campaign with highly intelligent algorithms, and most transactions transfer through it. Additionally, the game elements embedded in the challenges have several functions that reflect collaboration and sociality. This is somewhat new regarding traditional ways of implementing crowdsourcing (see chapter 3.2) where contribution of the crowds are often in primary role and technology provides mostly tools for enabling the interactions or processing the results (see also The Wisdom of Crowds, Surowiecki 2005).

Interestingly in Konecranes' and Kaleva's cases, other social media – i.e. other than the digital platforms included in the cases – had only minor roles in the value systems. We

believe that reasons for this can vary. In Konecranes' case the challenge platform had built-in connections with other social media (e.g. sharing content in Facebook, Twitter or Google+) but these functions were only scarcely used. This may be due to the platform's other functionality that provided sufficient activities for sharing, commenting, and interacting during the challenge. However, GrabCAD used other social media (e.g. the company blog) to promote both challenges and winners of the challenges, which can be seen as a motivational factor for users and a benefit for the companies running the challenges. In Kaleva's case other social media were only scarcely used in promoting the campaign and inviting others. This may be due to the nature of the campaign and its working mechanisms – the campaigns are designed in a way that they minimize the effort for participating. Additional logins, registrations and social platforms may increase the noise and impair the actual participation.

However, LinkedIn and Wikipedia (representing connections to other social media) had considerable roles in the value system in xTune's case. As it was already discussed in chapter 5, from a systemic perspective these connections offer rather unique view for benefitting from social media through collaboration and user generated content by offering a built-in access to digital information. Interestingly, the digital information, in this case, is originally created for some other purpose (e.g. employees' personal LinkedIn profile or a skill description in Wikipedia) but brought to another context for gaining different benefits. xTune is in key position for delivering the benefits to a wide variety of actors in the value system. This may offer extensions to traditional views of Mashups (see e.g. Murugesan 2007, p.36). Otherwise, the case involved no major connections with other social media, and this may be due to the internal nature of xTune application in the case.

6.2. Conclusions

First and foremost, the purpose of this research was to increase general understanding on social media and ICT-related value creation by exploring different novel value creation approaches in intercompany networks. This purpose was transformed into a problem statement that guided the whole research process together with the supporting research questions (see chapter 1.1.1). In the previous chapter we answered the supporting research questions by discussing the key results in this study, which ultimately delivers an answer for the general research problem. The problem statement in this research is: *How can social media and novel ICT-based approaches be used to create value in recently emerged value creation models in intercompany networks?*

This study viewed the research problem from two important aspects – *value creation* and *novel social media and ICT-based applications and concepts* – with an extensive literature review on both themes and with three different case studies related to the study area. Essentially the results from the literature review showed a positive trend

towards combining the aforementioned two themes, as businesses and organizations are deliberately, and more increasingly, seeking new ways to benefit from business opportunities mostly enabled by Internet technologies (Zott et al. 2011a, pp.7–11). Moreover, value creation has turned into a social context-bound network activity where value is created on demand-basis with multiple network actors (van Heck & Vervest 2007, p.30; Vargo et al. 2008, p.148; Edvardsson et al. 2011, pp.336–337). In this respect, we identified several characteristics (see chapter 2.3.1) that reflect the aforementioned novel trends in value creation. These characteristics embed smartness comprehensively in the structures and dynamics of the networks and network actors outlining novel aspects for business logics, network design and orchestration, knowledge management and learning activities as well as ICT infrastructures.

The results also showed that there are numbers of different concepts and applications that essentially build on ideologies and tools of Web 2.0. Thus, value creation based on social media and other ICT-based approaches has also numerous possibilities. Within the scope of this study, we only viewed these approaches to some extent on general level and focused on crowdsourcing, swarm-work and gamification more intensively (see chapter 3). Also the case studies (see chapter 5) build around these selected concepts that benefited from social media and other modern ICT-based approaches. The results from the cases (see also chapter 6.1) viewed value creation from systemic perspective by identifying transactions and exchange of transactions in the case networks. In this process, modern ICT and social media had vital roles for offering the digital environment and technological solutions for delivering the transactions and enabling the required collaboration for co-creative activities in the value systems of the cases. By exploring the value systems and their operating mechanisms, we also identified several features that were similar to the aforementioned novel value creation characteristics. These features included collaboration and shared value, flexible transfer of information and knowledge, distributed operations and modularity, swarming and self-organizing (in the interaction of different actors and in form of artificial intelligence in applications), demand-based value creation, use of electronic intermediaries for coordinating, and flexible connecting and disconnecting of network actors.

Even though we acknowledged the social context-bound nature of value creation, we believe that the findings from this thesis can be generalized to some extent. We conclude that social media and other ICT-based tools are in vital role for enabling whole value systems and (at least some) characteristics that epitomize novelty. In this study social media and modern ICT were essentially affecting the value systems in the cases by delivering the principles of crowdsourcing, swarm-work and gamification into action and enabling the exchange of transactions and collaboration. We believe that similar approaches can be used in various other businesses or organizations to deliver the same features in value creation activities.

6.2.1. Academic contribution and managerial implications

In the first pages of this thesis we argued that value creation is in focal point of conducting business. This thesis highlighted and discussed several important themes under the topic of value creation and novel social media or ICT-based value creation approaches, and thus contributes on the topic area in many ways from academic research perspective. The study also introduces several managerial implications, even though the objectives of the study hold stronger academic orientation than traditional business research.

Firstly, for the general scientific or academic contribution, this study contributes in bridging the general research-gap regarding novel social media and ICT-based value creation approaches. Value creation is a popular research subject in academic and business literature and it has been studied from various perspectives (see e.g. Porter 1996; Gulati et al. 2000; Prahalad & Ramaswamy 2004). However, due to the novelty of the selected concepts (i.e. crowdsourcing, swarm-work and gamification) less is understood about the real benefits or value co-creation that the concepts may generate (see e.g. Afuah & Tucci 2013; Bloodgood 2013; Rauch 2013, p.282). This study especially focuses on these issues by introducing three distinct cases with social context-bound perspective on value co-creation, which is generally advocated for researching this kind of topics (Edvardsson et al. 2011, p.337).

Secondly, drawing from the results of an extensive literature review on the topic of SBNs, the study identifies characteristics that epitomize *smartness* and embody novel value creation approaches. We believe that novel concepts, such as crowdsourcing, swarm-work and gamification, and their applications may hold several features that represent, or can be used for achieving these characteristics. This provides new perspectives generally in SBN literature (see also Goldman et al. 2009), and especially on the discussion considering electronic intermediaries, network orchestrating and quick connecting/disconnecting in networks (see e.g. van Heck & Vervest 2007; Basu & Muylle 2008; van Oosterhout et al. 2008).

Finally, since value creation is more increasingly based on Internet technologies and ICT-based solutions we questioned the capabilities of traditional research methods in studying these topics. After considering multiple research methods we ended up choosing netnography. During the netnography we observed several digital platforms and user interaction in them. The focus of our research was highly in the platforms and its capabilities in enabling the behavior and contribution of different actors, and not purely in the analysis of computer mediated communication for achieving an ethnographic understanding of a cultural phenomenon, in which netnography is traditionally used (Kozinets 2010, p.60). Thus, the conducted netnography represents a

novel use case, and offers fresh insights on general scientific methodological debate regarding netnography.

As for the managerial contributions, firstly, this study provides a visualization and analysis of value creation in three distinct cases that represent novel approaches for value creation through the introduced concepts (i.e. crowdsourcing, swarm-work and gamification). Case studies provide new information especially for case organizations but also for other businesses and organizations interested in crowdsourcing, swarm-work, or gamification related value creation. Comprehensive use cases promote general awareness of novel value creation approaches, and help to understand and assess their suitability and potential benefits in different industries. Secondly, the study introduces several frameworks for visualizing and analyzing value creation in networked environments, and provides more detailed description of Biem's and Caswell's (2008) value network model. These frameworks are important in delivering understanding on value creation as social context-bound systems. Moreover, identifying different network actors, their capabilities and resources, and analyzing the exchange of transactions between the actors may offer important insights on assessing and developing business operations or the value network as a system.

Finally, the study provides an overall picture of the current state of value creation and some insights on future trends of value creation. The case studies, discussed in this study, describe only snapshots from the full capabilities the selected concepts may offer. Moreover, due to novelty of the concepts and the quick pace of development in ICT in general (see e.g. Evans & Annunziata 2012; Lehti et al. 2012), we can presume significant changes in business environments in the near future (see also chapter 2.3.2). To understand the change, the identified novel value creation characteristics may offer useful insights on distinguishing possible or potential large scale development directions for companies and organizations.

6.2.2. Limitations and suggestions for future research

After discussing the results of this study and describing the general scientific contribution and managerial implications, we wish to acknowledge some limitations this study contains. Limitations are natural part of any research and also important for identifying topics for future research.

We would like to note that the findings of this study should be treated as preliminary for several reasons. Firstly, novel value creation is a vast research subject and this research focused on three individual cases from the selected value creation approaches (i.e. crowdsourcing, swarm-work and gamification). There are numerous other ways of implementing the selected approaches and also a myriad number of other approaches on conceptual level. Moreover, the rapid development of the concepts and emerging novel

approaches increase the complexity of the topic. Thus, we recommend caution when drawing conclusions from the discussed cases. It is essential to understand that due to the social context-bound nature of value creation each approach or case is individual and dependent on multiple variables, such as the use context and its complexity. We cannot guarantee that similar results would occur if some other businesses decided to use for example GrabCAD's services in crowdsourcing engineering tasks.

Secondly, we see some limitations in the selected cases as they only partially fit the advocated general research requirements for this kind of topics (Edvardsson et al. 2011, p.337). Konecranes' and Kaleva's cases were not completed at the time of the interviews and observations, and xTune's case described merely the supplier side of the case without focusing on a specific use context (i.e. customer perspective). Thus, some of the benefits and results are only potential at this point, and they have to be confirmed with interviews or other methods after completing the cases. In Konecranes' and Kaleva's case this would include interviews with suitable persons after the products and services have been commercialized. In xTune's case this requires researching and collecting information on the implementation and utilization of xTune in a specific business or organization.

Thirdly, drawing a conclusion from the previous limitations, the generalizability of individual case studies remains an issue. Generalization in this study relies on the value creation characteristics we believe epitomize novelty and smartness (see chapter 2). Our prior classification of novel value creation characteristics was drawn from the results of an extensive literature review on the topic of SBNs (see Vervest et al. 2005; 2008; 2009). Thus, we agree that the introduced classification is limited and fully without wider scientific confirmation. Substantial research should be carried out to resolve this issue. Moreover, we found no preliminary research on focusing especially on novelty in value creation regarding the selected concepts. This may be due to novelty of the concepts and lack of sound theoretical premises as well as scarcity of documented case studies. This would provide an interesting research topic. Also, a proper classification scheme for topic related case studies would provide some clarity to the complexity of the research area.

Finally, we would like to address some limitations regarding the analysis of the specific cases in this study. There are several models for analyzing value creation in networked environments – different models focus on different things, and are good at exploring value creation approaches from different perspectives. We understand that using other than the selected model (i.e. Biem's and Caswell's value network model), could have provided different kind of results and findings. Thus, the results may be limited to the used framework and its capabilities. We suggest that an extensive review on different analysis models with multiple cases, or analyzing a single case with multiple models would provide further clarification to these issues.

In addition, some limitations regarding the used methodology should be addressed. Netnography is a novel research method and the theoretical establishments and its legitimacy are still under development (Maclaran & Catterall 2002, p.325; Kozinets 2010, p.184). As it was discussed in the previous chapter, the way we implemented netnography in this study is not traditional, and thus the suitability of the method in these settings can be questioned. We also acknowledge that the method in general is susceptible to subjectivism and shallowness (see e.g. Kozinets 2007; Beneito-Montagut 2011) and certain subjectivity is present also in this study due to researcher's subjective role in participant observations. To overcome this, from the case organizations' perspective, we used focused interviews to complement and confirm the data discovered through observations. However, we do not know to what extent this was enough for confirming the general validity and reliability of the study. To conclude the methodological discussion we suggest that several other netnographies with similar research settings and objectives should be conducted in order to discover good practices and a clear process for implementing the method, as well as to identify strengths and weaknesses of the method in general.

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Appendix 1: Interview themes

Interview themes:

1. Basic information
    a. The company and the case
    b. Interviewee's role in the organization and the case
2. New and visionary ways of creating value
    a) Elements of a visionary value creation model
    b) The role of the elements in case organization
3. The case value system
    a) Actors involved in the system
    b) Resources and capabilities possessed by the actors
    c) Value transfer and value exchange in the case network
    d) Media through which the value is transferred
4. Measuring the value system
    a) Case organization's means for assessing or measuring the value network
    b) Benefits of the value creation model
    c) Issues and challenges concerning the creation or shifting of value in the network

Key terms and their explanations:

- Value network =

  A value network is any web of relationships that generates tangible and intangible value through dynamic exchanges between two or more individuals, groups, or organizations. Value network also includes the roles and interactions through which people engage in value exchanges (Allee 2002; 2008). For example your organization and its customers, partners, and other actors form a value network, in which value is transformed from one actor to another.

- Resources and capabilities =

  Resources or assets are the material, technology, capital, and knowledge possessed by one actor in the value network. Capabilities describe the activities, processes, and dynamics of an actor in the network. (Biem and Caswell 2008.) Resources and capabilities are bundled together to achieve uniqueness in the markets (Barney 1991; Weigand et al. 2007). Resources are often bound together - A firm may have a capability of offering a unique service and professional knowledge as a resource to do so.

- Value creation =

  Value creation is the formation of relative worth, utility or importance in a product or service in such a way that the utility or importance be exchanged within a market for some sort of gain (Briggs 2009). Exchange may happen for example between organizations and their customers, partners, and stakeholders. Organization's resources and capabilities, as well as the resources and capabilities offered and transferred in the value network, are utilized in the value creation process.

- Value creation model =

  A description of the organization's value creation process. The model is usually part of the wider concept, business model, which depicts designs of transactions and governance to create value through the exploitation of business opportunities (Amitt and Zott 2001).

- Value transaction =

  Value transactions are the basic elements of value exchange in the value network. A transaction occurs when a deliverable originated by one actor is conveyed to and received by another actor (Allee 2008). Value transactions form value exchange when two or more reciprocal value transactions occur. Transactions transfer in networks through different media, such as conversations, emails, community forums, or collaborative tool