Teea Palo

BUSINESS MODEL CAPTURED?

VARIATION IN THE USE OF BUSINESS MODELS
TEEA PALO

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Variation in the use of business models

Academic dissertation to be presented with the assent of The Doctoral Training Committee of Human Sciences, University of Oulu for public defence in Arina-sali (Auditorium TA105), Linnanmaa, on 7 February 2014, at 12 noon
Palo, Teena, Business model captured? Variation in the use of business models.
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Abstract

This study examines the ways in which business models are used by market actors in the context of emerging technology-based services. Such services are developed, produced and marketed by multiple market actors forming business nets within wider networks and markets. In such nets, market actors aim to connect emerging technology-based services with potential markets. The business model is suggested to act as an analytical device for the actors to use in their activities.

By integrating business models into two contemporary discussions on networks and markets in marketing, the study widens the scope of the application of business models and explicates the variation in the use of business models. This study is interested in the dynamic, processual, and interactive nature of business models instead of their mere structure, requiring a research approach that allows the phenomenon be studied closely, longitudinally, and within its context. Hence, the study employs a qualitative multi-method approach for studying the use of business models.

The empirical setting of the study is based on two research projects: the UBI service pilot and the IT service development project, in which different types of market actors developed and tested new technology-based services. Using a variety of methods, such as interviews, observation, and Delphi questionnaires, data were gathered longitudinally on the activities of the actors in business nets and markets.

The results of the study show that business models can be used in multiple ways. They are used as structures and narratives to develop and stabilize business. Business models frame action at different interlinked levels (organization, net and market) in which business models are shared in relation to the past, present and future. Hence, this study explicates the business model concept by integrating it into the network approach and market studies literature in marketing, revealing novel perspectives on business models. The study also contributes to the network approach by explicating the nature and formation of business nets by examining the use of business models in business nets. Finally, the study adds to our understanding of market dynamics by incorporating the business model concept.

Keywords: business model, business net, market, technology-based service
Palo, Teea, Liiketoimintamallin käytön moninaisuus. 
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Tiivistelmä


Tutkimus osoittaa, että liiketoimintamallia voidaan käyttää monella tavalla. Sitä käytetään sekä verkostomaisen liiketoiminnan nykyhetken rakenteen kuvaamiseen ja vakauttamiseen että liiketoiminnan tulevaisuuden vision kertoimiseen ja kehittämiseen. Liiketoimintamalli ohjaa markkinatoimijoiden toimintaa eri tasoilla (organisaatio-, verkko- ja markkinataso), luoden yhteistä ymmärrystä toimijoiden välillä menneestä, nykyhetkестä ja tulevaisuudesta. Tutkimus paitais tarkentaa liiketoimintamallin käsitetä verkosto- ja markkinanäkökulmista, myös lisää ymmärrystä liiketoimintaverkkojen luonteesta ja muodostamisesta sekä markkinoiden dynamiikassa.

Asiasanat: liiketoimintamalli, liiketoimintaverkko, markkina, teknologiaa hyödyntävä palvelu
Acknowledgements

This is it, the end of a life-changing journey. It has truly been a learning experience, not only as a researcher but also as a human being. I began this journey clueless of all that would be ahead of me, and now I am writing these acknowledgements rich with so many experiences and people in my life. And now I get to thank you.

First and foremost, I would like to thank my supervisor, Professor Jaana Tähtinen, who has made this journey worthwhile. I have been lucky to have such a committed and precise supervisor who has consistently and persistently provided comments on my work, who has always had the time for a chat when needed and encouraged me in moments of despair, and made certain I would not lose my way. I would also like to thank my second supervisor, Professor Timo Koivumäki, for the opportunity to be involved in many interesting projects and for his support during this project. I have also been privileged to have an ‘external supervisor’, Dr. Katy Mason. Working with her, my research took a leap into something that I did not know I was missing until we had our first discussion. Without her input I would not be where I am now. During my studies, I have also had the opportunity to work with a futures research expert, Hannu Linturi, who kindly tutored me in methods that were new to me.

I am also grateful to my pre-examiners, Professor Luis Araujo and Associate Professor Suvi Nenonen. Thank you for taking the time to read and evaluate my work, and for the valuable comments to clarify and sharpen my message in the thesis.

During these years, I have had amazing fellow doctoral students who have become my closest friends. A thank you goes to my girls in an alphabetical order: M.Sc. Kerttu Kettunen, M.Sc. Kaisa Koskela-Huotari, M.Sc. Minna Mäläskä, and D.Sc. Elina Pernu. We have had endless discussions on research and life, shared ups and downs, and had the best parties. Without you this would not be the same. Kerttu, you have seen it all, my happiest and weakest moments, and you always find the right words no matter what. I love our conversations. Kaisa, you are my inspiration. Without your support during this journey, I would have lost my faith in myself. Minna, we two are alike. I enjoy life more when I am with you. Thank you for showing me that a little bit of craziness is a good thing. Elina, I have been so lucky to travel this journey together with you. I know I can count on your support whether I am worried about work or buying an expensive pair of shoes. A special thank you also goes to colleague and friend M.Sc. Vuokko Ilanen. Despite
all the craziness, you are still here. Thank you for your patience and help during
this project.

I would also like to thank my other fellow doctoral students, D.Sc. Tuula
for inspiring and enjoyable discussions over lunch and coffee breaks. A special
thank you goes to Outi for her contribution in the data collection.

I have been privileged to work in an inspiring research community. I am
grateful to the Oulu Business School and the Department of Marketing for
supporting my doctoral studies and enabling me to explore the world of research
through conferences, doctoral consortiums, research visits and courses. A special
thank you goes to D.Sc. Satu Nätti. Without your encouragement during my
Master’s thesis, I would not have started my doctoral studies. I would also like to
thank D.Sc. Annu Ristola, D.Sc. Hanna Komulainen, D.Sc. Antti Kauppinen, and
D.Sc. Jaakko Sinisalo for their support and our refreshing discussions on research
and life in general.

I have been privileged to work in three research projects during my doctoral
studies. I would like to thank all my fellow researchers with whom I have worked.
A special thank you goes to the researchers in the Technical Research Centre of
Finland VTT with whom I collaborated in the data collection in one of the
projects. My gratitude also goes to the company representatives and interviewees
for devoting their time for this research.

I am also grateful for the financial support received from Tekes, the
Foundation for Economic Education, the Finnish Science Foundation for
Economics and Technology (KAUTE), the Tauno Tönning Research Foundation,
the Marcus Wallenberg Foundation, Oulun kauppaseuran säätiö, and TeliaSonera
Finland Oyj:n tutkimus- ja koulutussäätiö. I also wish to thank Finnish Graduate
School of Marketing (FINNMARK) for supporting my studies.

During these years, I have been fortunate to have people around me who care
for me and put up with me. Johanna, you are like a sister to me, and know the best
and worst of me. My godson Eemil and his little sister Enni take my mind off of
work in an instant. Thank you for the distractions.

I would also like to thank my family for all their love and faith in me. Janne,
Sanni, Janna and Jessica, even though you may not even be aware of it, you have
been irreplaceable on this journey. The girls have won my heart over and make
me smile however stressed I am. Isä, sinä olet opettanut minulle mitä kova
työnteko on, ja sitä noudattaen olen nyt tässä. Kiitos kärsivällisyydestä vaikka en
aina olekaan ehtinyt ilmoitella itsestäni. Mum, you have not once lost your faith
in me but have always encouraged me. Thank you for being the best mum and friend. Thanks goes to Matti as well for taking care of the gourmet food service almost once a month even though he is 500 kilometers away.

Finally, thank you Teppo for your companionship, support and patience. This dissertation should have your name on it for all of the trouble, stress and worry you have had to put up with me. You have learned what it is like to live with an academic, and yet you are still here. This would not have been possible without you, and for that, I am ever grateful. I love you.

But, although this is an end, it is also a beginning.

On a very sunny day in Honolulu, December 2013

Teea Palo
List of original publications

This thesis is based on the introductory chapters and the following papers:


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1 Introduction

1.1 Background

Change is constant in technology, society, economies, and markets. Market actors can attempt both to stabilize and bring about change in their surrounding environments. In doing this, they increasingly engage in research and development (R&D) activities (e.g., participating in research projects involving both companies and non-profit institutions) to create new technological applications with other market actors. However, companies that develop technological innovations often face difficulties in bringing their new products or services to market. These difficulties may result, in part, because the market has no clear structure (Möller & Svahn, 2009) but rather is “in the making” (Kjellberg et al. 2012: 220) during the early emergence of a new technology.

Business models have been blamed for the failure to bring new technological innovations to market. It has been argued that existing business models may need to change or new models may need to be developed to create value from technology (e.g., Chesbrough & Rosenbloom 2002). The business model canvas developed by Osterwalder and associates (Osterwalder et al. 2005, Osterwalder et al. 2010) has been widely used in both scientific research and business development. The canvas, which distinguishes specific building blocks of a business model, can be used to identify and describe a business model for a new technological innovation. This canvas merits attention for being a simple but comprehensive tool for providing a thorough description of what the company does or should do.

Despite important recent developments in the business model literature, business models are still confined, to a large extent, to the abovementioned conceptualizations. Instead of examining whether business models are right or wrong or what the building blocks or elements of a specific business model are, explanations for the failures may lie in the way business models are understood and used (see e.g., Doganova & Eyquem-Renault 2009) by market actors.

Harrison and Kjellberg (2010) discuss the construction of market segments in contrast to the identification of existing segments. In many cases, when technological applications are developed, there are no existing market segments for which to direct specific marketing activities, but constructing a market requires the mobilization of “varying bodies of expertise and calculative
agencies, including marketing practices”, which play “a performative role in helping to create the phenomena they purportedly describe” (Araujo 2007: 211–212). An emerging network of actors is required to contribute to the development, production, and application (Håkansson et al. 2004, Lundgren 1995, Möller & Svahn 2009) as well as to the commercialization and marketing of a new technology (Aarikka-Stenroos & Sandberg 2012).

This study examines the ways in which business models are used by market actors in the context of emerging technology-based services. This study thus widens the scope of the application of business models and explicates the variation in the use of business models.

1.2 Justifications for the research

This section describes the research gaps addressed in this study and establishes the importance of the research topic. The field of business model research is highly fragmented, and its legitimacy as an academic research stream has been criticized. The business model concept is grounded in research from myriad fields (Chesbrough & Rosenbloom 2002, Mäkinen & Seppänen 2007, Osterwalder et al. 2005, Shafer et al. 2005, Teece 2010), building on ideas from, e.g., strategic management and entrepreneurship, value chains and systems, strategic positioning, resource-based theory, strategic networks, and cooperative strategies (Amit and Zott, 2001; Morris et al., 2005). Therefore, the concept still lacks a solid theoretical foundation in economics and an ‘intellectual home’ in the social sciences (Teece 2010). Although research on business models draws ideas from a wide range of areas, the business model concept has yet to receive widespread attention in the marketing discipline, though the concept could enrich discussion on marketing (Nenonen & Storbacka 2010). Marketing scholars have engaged the business model concept only to a very limited degree; however, marketing researchers, especially in industrial marketing, could learn from the business model literature, and vice versa (Coombes & Nicholson 2013). In this study, marketing is limited to discussion on markets and networks. Drawing from the above information, there is a need to integrate business models into the network approach and literature on markets within marketing to better understand the use of business models. This is the main research gap to be addressed in this study.

The business model concept was first introduced in the academic literature in 1957 (Bellman et al. 1957), and after the internet boom in the 2000s, studies on business models increased dramatically. The business model concept has been
used in both academic research and practice regarding a variety of issues in business and is often used interchangeably with terms such as business plans, business concepts, and revenue logics. Perhaps because of its broad use, the concept has been criticized for its usefulness—or rather its uselessness (see e.g., Porter 2001). Many studies acknowledge the fuzziness of the term and recommend that clearer definitions be proposed before the concept can be used properly (e.g., Magretta 2002, Osterwalder et al. 2005, Shafer et al. 2005). In addition, despite much interest in defining business models and dividing them into smaller units or elements, business model research still lacks studies on business model evolution, development, and innovation (Demil & Lecocq 2010, Teece 2010). Research mainly has studied business models as descriptions of a business at a single point in time and thus has failed to consider the use and operation of business models (Doganova & Eyquem-Renault 2009) at different levels of the company, the network, and the market. Only a limited amount of formal research has examined the dynamics and processes of business model development (Johnson et al. 2008) and the influence of the network on a business model and vice versa (Mason & Spring 2011). Thus, elaboration on the concept of business models is necessary, forming the second research gap to be addressed in this study.

One of the starting points for this study is continuous technological development and its influence on business. It is clear that "technology by itself has no single objective value" (Chesbrough 2010: 354). Previous research has recognized a high level of failure of new firms in technology-based markets (Srinivasan 2008). Translating the results from scientific research into industrial innovation has proved problematic and challenging (Lundgren, 1995), and technological innovations and achievements commonly fail commercially (Teece 2010). Although some studies have focused on different aspects of technology-based markets (Cunningham 1995, Heide & Weiss 1995, Weiss & Heide 1993), there is still a lack of studies concerning the creation of new markets for emerging technologies (Simakova & Neyland 2008).

Markets have traditionally been conceptualized as stable entities, where demand and supply meet and lead to equilibrium. Hence, markets are structures of exchange between buyers and sellers. This conceptualization of markets as price mechanisms has received criticism, calling for alternative conceptualizations of markets (see Snehota 2004). Markets have been widely studied by economists, but surprisingly, marketing scholars have taken a rather limited view on markets (e.g., Araujo et al. 2010b, Easton 2004). The market orientation construct (e.g.,
Jaworski & Kohli 1993, Kohli & Jaworski 1990) has dominated the field. Recent developments in the literature emphasize the more dynamic nature of markets, which have been addressed by the market driving construct (e.g., Jaworski et al. 2000, Kumar et al. 2000). The dynamic nature of markets is also foregrounded in the market studies literature (e.g., Araujo et al. 2010a, Araujo 2007, Kjellberg & Helgesson 2006, Simakova & Neyland 2008), calling for a renewed refocus regarding the understanding of what a market actually is (Mason 2012) and the study of markets in the making rather than existing markets (Kjellberg & Helgesson 2007). Moreover, prior research has called for the processes and tools through which markets are shaped, such as business models, to be elucidated (see Kjellberg et al. 2012). Hence, there is a need to explicate the dynamic nature of markets to understand how markets can be shaped by using business models, forming the third research gap to be addressed this study.

In addition to being conceptualized by static or dynamic views of markets, market conceptualizations can also be divided into transactional and relational dimensions (Easton 2004). In the relational dimension, markets are conceptualized as networks of market actors (Håkansson et al. 2004, Möller & Halinen 1999, Storbacka & Nenonen 2011b). The view of markets as networks has been strongly promoted by the Industrial Marketing and Purchasing (IMP) group, also known as the industrial and network approach (INA), which emphasizes that markets are constituted by various actors connected by continuous relationships (Snehota 2004). It has been suggested that to understand the evolution of markets, we need to consider the embeddedness of market actors in different networks of interpersonal relationships and larger social structures (Halinen & Törnroos 1998). Following this view, markets consist of networks of market actors (e.g., Storbacka & Nenonen 2011b).

Studies on relationships and networks are wide ranging, and the phenomena have been analyzed using different theoretical backgrounds and methods and at different levels: these studies have thus produced different results and conclusions (Ritter & Gemünden 2003b), resulting in a variety of different network approaches (Araujo & Easton 1996). The INA is a strong research stream in this area. Another key stream of literature focuses on strategic networks and micro-level networks. Drawing on ideas from these two approaches, a third, intermediary approach focuses on nets (focal, strategic, business, and value nets), specifically smaller, limited nets within larger networks and markets. Previous research has given less attention to business net development or to intentionally developed nets (Möller et al. 2005). The majority of research has examined
existing business networks (Möller & Svahn 2009), but less attention has been
given to their development processes (Möller et al. 2005). In addition, although
previous research has studied R&D networks and innovation networks to some
extent (e.g., Heikkinen et al. 2007), research on networks in commercializing
innovations is still scarce (Aarikka-Stenroos & Sandberg 2012). This shift from
individual actors and dyadic transactions in the market toward the locus of value
creation within the networked market among various actors necessitates a
corresponding change in the concepts depicting value creation (Nenonen &
Storbacka 2010). The business model design has been suggested to be a unifying
unit of analysis for capturing this kind of value creation arising from multiple
actors and sources (Amit & Zott 2001). Explicating the formation and evolution
of business nets by using business models can contribute to our understanding of
nets and forms the fourth research gap to be addressed in this study.

Despite the valuable contributions in the business model research regarding
the business model concept and the more recent efforts to understand the more
dynamic nature of business models, gaps remain in our knowledge of the use of
business models. There has been little effort to integrate the business model
concept into discussions on networks and markets in marketing. Typically,
business models are centered on a single company, which is also responsible for
developing the business model (Amit & Zott 2001). This approach provides a
rather internal view of business models. Therefore, this study takes a broader
perspective on business models to elaborate the use of a business model in a net
of actors to connect an emerging technology-based service with a market. A
business model can not only describe the actions of different actors in developing,
producing, and marketing emerging technology-based services but also be used
by the actors in the net to perform activities in the market. Hence, a business
model represents more than just the revenue logic of a single company or its
business plan; rather, it is a broader concept that has the potential to be used by
market actors in the net and the market.

1.3 Research problem

Drawing on the abovementioned gaps in the extant research on business models,
markets, and networks, the objective of the study is to understand the use of
business models by showing the ways in which market actors use business models
in emerging technology-based service context. Emerging technology-based
services are developed, produced and marketed by multiple market actors who
form business nets (within wider networks and markets). In such nets, market actors aim to connect emerging technology-based services with potential markets. Following the conceptualization of markets in the market studies literature, this study does not aim to describe or analyze a specific technology-based service market in detail but instead looks at market shaping through the business model concept. The study thus integrates business models into two contemporary discussions on networks and markets in marketing. To accomplish this objective, the study answers the following research question:

*How do market actors use business models in emerging technology-based service context?*

The main research question is divided into the following three sub-questions:

1) What is the essence of business models?
2) At which levels do market actors use business models?
3) What kinds of activities do market actors perform with business models?

The first sub-question, “What is the essence of business models?” lays the foundation for the use of business models. Before we can understand the ways in which market actors use business models, we need to understand what business models are. Hence, the essence of business models refers both to 1) the perspectives taken on business models and 2) the characteristics of business models.

The second sub-question, “At which levels do market actors use business models?” focuses on where and with whom market actors use business models. The levels refer to the boundaries of business within which market actors act with business models, e.g., internal or external to an organization.

The third sub-question, “What kinds of activities do market actors perform with business models?” refers to those market actors’ activities that involve business models, or where business models are part of the activities at any of the different levels.

The main research question, “How do market actors use business models in emerging technology-based service context?” addresses the use of business models, which consists of the essence, levels and activities of business models.

To answer the research questions, this study first builds a theoretical framework to integrate the business model concept into two related discussions
on networks and markets in marketing. The empirical part of the study employs an integrative, multi-method approach to acquire and analyze data on the complex phenomena at the interface of different disciplines. Two settings are chosen for empirical investigation: net-based and firm-based service development initiatives. As an outcome of the study, an empirically based framework of the use of business models is presented that reveals the variation in the essence of business models in the levels at which market actors use business models and in the activities that market actors perform with business models.

This study consists of three individual research papers that help answer the research questions. Each paper has its own objective and research problems, and the research questions presented in this study are answered by combining the theoretical and empirical understanding gained throughout the research process. Papers I and II have been published in peer-reviewed international journals and paper III in conference proceedings. The details, paper-specific research questions, and the contribution of the present author in the papers are presented in the Table 1.

Table 1. The research papers of the thesis.

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Paper-specific RQ</th>
<th>Contribution of the present author</th>
</tr>
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</table>
For papers I and II, the present author had the responsibility of planning and conducting the study as well as writing the papers. The co-author provided valuable insights during the research processes and helped modify and revise the texts. For paper III, the work of planning and writing the papers was more equally divided between the authors. The present author had the main responsibility of collecting the data in the research project and performing most of the data analysis. Some of the data were analyzed in cooperation with the co-author but based on thorough case descriptions offered by the present author. A review of the extant literature was planned in cooperation between the authors. The text produced by the present author was modified by the co-author, who is a native English speaker.

The papers focus on the conceptualization, development, and use of business models, revealing the variation in perspectives regarding the concept. Through a synthesis of the individual papers, the research questions of the thesis are answered. The research framework is described in Figure 1.

Fig. 1. The research framework.
1.4 Positioning and contribution of the study

This study makes use of several streams of literature to elucidate the variation in the use of business models: business models, network approach, markets, business opportunities, and framing. These literature streams have been chosen based on the best possible understanding of their compatibility and complementarity to answer the research questions. As previously noted, there is no theoretical consensus on the business model concept. Rather, it is an interdisciplinary concept drawing on a range of academic literature streams. The present study aims to integrate the concept into the discipline of marketing and thus the study is first positioned within the wide area of marketing literature.

As Araujo et al. (2010b) have noted, there is no recognized set of ideas that can be called marketing, but it depends on local contingencies. For the purposes of the present study, marketing is limited to discussion of markets and networks. Following the objective of the study, in addition to the business model literature, the network approach (especially business nets) and markets (especially market studies) are important theoretical premises for the study. These approaches are also compatible with each other, representing the ideas of more contemporary marketing (see e.g., Håkansson et al. 2004), and complementing each other in understanding actors and their relations in constructing markets. In addition, following the notion of marketing as a societal process that enables economic exchange (instead of the more traditional notion of marketing management) (Araujo et al. 2010a), sociological perspective on the use of business models is adapted.

The phenomenon under focus—the use of business models—is perceived to be embedded in broader social structures. In sociology, “the nature of human action and the acting itself” is of critical importance (Giddens 1984: xvii). Business models do not exist without actors and activities. According to Granovetter (1985: 487), “actors do not behave or decide as atoms outside a social context”; their “attempts at purposive action are instead embedded in concrete, ongoing systems of social relations”. Hence, market actors do not behave based simply on economic rationality. Rather, their decisions and actions are shaped by structures of relations, which in turn are shaped by the actors themselves. Thus, economic action is embedded in networks of social relations (Granovetter 1985) and business models are considered in the present study as one possible tool for understanding such relations in markets and business nets. More specifically, economic sociology considers societal and organizational
issues (Stark 2009). Economic sociology has recently been reoriented toward the study of markets (see e.g., Callon 1998) and has begun to address the role of marketing in the construction and operation of markets (Araujo 2007).

The present study contributes to the business model literature by enriching understanding of the concept of business model and its use. This study reviews literature on business models concerning the essence and activities of business models. Much of the existing business model research considers business models as something that companies innovate and transform (e.g., Chesbrough 2010, Teece 2010), and in the end, own. Despite its credits, this is a rather limited view on the essence of the business model concept. Business models have rarely been positioned within the marketing domain, nor has their use in the activities of market actors been examined. The present study examines business models in the making instead of existing business models. Hence, a business model is conceptualized not as an outcome of a process but as a device that is put into practice (see Kjellberg & Helgesson 2007) in emerging technology-based service context.

The secondary contribution of the present study is made to the network approach (and more specifically to the literature on business nets). This study employs a network approach to understand the actions and relations of market actors. The IMP group has developed a strong research tradition in this area, which is also known as the INA. This approach has elucidated the relationships (interaction approach) and networks in industrial markets (see e.g., Håkansson & Johanson 1992, Håkansson 1982). Another key stream of literature focuses on strategic networks and alliances, which are more based on the North American research tradition and focus on narrower, micro-level networks (e.g., Gulati et al. 2000, Jarillo 1988). Borrowing and combining ideas from both of these research traditions, a third, intermediary approach focuses on nets (focal, strategic, business, and value nets) (e.g., Möller et al. 2005, Möller & Rajala 2007), which delimit focus on smaller, limited nets within larger networks and markets. This research applies ideas from all three research streams but limits the focus to business nets involving actors who are critical to the success of the technology-based service. To better understand the net of market actors and their relations constructing a market, the study integrates the business model concept into the network approach.

Literature on markets is also reviewed in the present study, including the market orientation and market driving constructs, and the market studies literature. The INA is also used to understand the networked nature of markets.
although the discussion is mainly premised on the network approach in this study. The conceptualization of markets in this study is mostly adapted from market studies, which draw on the recent developments in economic sociology initiated by Callon and his associates (Callon 1998, Callon & Muniesa 2005). Drawing on economic sociology instead of describing and explaining how the emerging technology-based service market works and what its properties are, it is more important within the scope of the study to understand how market actors act and shape the market by using business models. This approach is concordant with Kjellberg and Helgesson (2007: 141), who state that “it is impossible in principle to define the list of properties that is typical of markets” and that it is more critical to focus on “how actors are able to do so in practice”. The business model concept is thus integrated to the market studies literature to better understand how markets can be constructed, and this way this study offers a contribution on our understanding of markets.

In addition to the literature on business models, networks and markets, the study makes use of the literature on business opportunities (based on entrepreneurship) and framing (based on sociology). These areas were chosen during the research process based on their possibility to help understand the use of business models. First, as the business model literature is strongly interlinked to entrepreneurship, and one of the key purposes of business models is to construct and exploit a business opportunity (in novel business fields such as technology-based service innovations), discussion on business opportunities is employed. Instead of perceiving entrepreneurial skills as centered solely on certain individuals as much of the extant entrepreneurship literature holds (see e.g., Ardichvili et al. 2003, Eckhardt & Shane 2003), the study emphasizes the distributed nature of entrepreneurship (see Garud & Karnøe 2003) across actors in the net. This is compatible with the other literature streams employed in the study. In addition, to understand the use of business models in business nets and markets, literature on framing is employed. The use of frames has previously been understood through studies on social movements (e.g., Benford & Snow 2000). This study integrates the framing perspective into a business context and thus provides a more thorough understanding of how business models frame action.

To gain a contextual understanding, the nature of technology and technology-based services is discussed. Human agency distributed across various actors is considered to be important in shaping and developing technologies (Garud & Karnøe 2003). Although service is a key concept in this study, the service marketing literature is not employed. Similarly, literature on value creation and
value-creating networks is not reviewed, although such literature is acknowledged to be related to the business model concept and is essential in the marketing discipline. To provide some limitations for the study, however, this literature is not included. The concept of service, involving the notion of value creation, is defined in Chapter 1.5, which introduces the key concepts of this study.

The positioning and contribution of the study is summarized in Figure 2. The main theoretical discussion employed in the present study is the business model literature. The network approach and literature on markets within the marketing discipline are the other key theoretical domains used in this study. Business opportunity literature from entrepreneurship and framing literature from sociology are used as secondary, additional discussions to help understand the use of business models. The study makes a contribution first to the literature on business models and second to the network approach (more specifically, business nets) and market studies (INA being included in both). The study aims at theory development related to business models by integrating the concept more profoundly into the network approach and market studies within marketing.

Fig. 2. Positioning and contribution of the study.
1.5 Key concepts of the study

A business model is one of the key concepts in this study, and although one of the aims of the study is to provide an understanding of the essence of business models, a basis for the business model concept needs to be provided at this stage. Put simply, a business model is a model of a business. However, instead of perceiving a business model merely as a description of a company’s business at a single point in time, a business model is perceived to be a device for companies and other market actors to use in business. Hence, a business model can also be considered part of business activities. In this study, business models are viewed from the business net perspective and in relation to the market. In this way, the business model is acknowledged to be a concept that can be of use for companies and other market actors.

A net refers to a smaller, limited group of actors within larger networks and markets that have a common goal and shared understanding of what needs to be done to reach that goal. Terms such as business nets, value nets, and strategic nets and networks have been used in the literature interchangeably, but this study uses the term business net (or net). This study focuses on intentionally developed business nets that need to be formed for developing, producing, and marketing emerging technology-based services. Nets are embedded in markets.

A market is constructed by the activities that market actors perform. No market exists without actors and their activities, and hence, markets are co-created by market actors. Following the network approach, markets consist of nets of market actors. To emphasize this point, the concept of the networked market is also used in this study to characterize markets (see Storbacka & Nenonen 2011b). However, markets are not equivalent to nets. Nets are smaller, strategic groups of actors (as defined above), whereas markets are larger entities which may consist of several different nets (although an actor can be involved in more than one net at a time).

Market actors in this study refer to organizations, including companies and other actors, in the market, such as financing bodies, research institutions, regulators, and municipal organizations. Market actors may engage in common activities to develop, produce, and market new technology-based services and, in this way, form business nets. Such actors are connected by continuous relationships.

Framing refers to the ways in which a business model or its elements are given meaning and used by market actors to create a shared understanding and
engage other actors in and outside an organization into action. Frames can be understood as "schemata of interpretation" (Goffman 1986) that guide both individual and collective action (Snow et al. 1986).

A technology-based service refers to an offering that employs technology in some way. Such services may include elements that are material and physical (e.g., hardware) or nonmaterial (e.g., software). The specific types of technology-based services examined in this study are ubiquitous services (also known as Internet of Things (IoT)) and information technology (IT) services, which are described in greater detail in Chapter 2.2. According to Araujo and Spring (2006), services are always involved in complex business relationships, whether they are perceived to be a separate part of a transaction or bundled with product sales. Thus, service can be defined as "the application of specialized skills and knowledge" (Vargo & Lusch 2004: 6), where goods are appliances that are used in service provision (Lusch & Vargo 2006). This view is concordant with the service-dominant logic that has also been claimed to act as an impetus for redefining markets, where market actors integrate resources through interaction to co-create value (Lusch & Vargo 2006, Storbacka & Nenonen 2011a). Although this study does not make distinctions between goods and services, the shift toward service orientation and provision (e.g., in manufacturing) (Araujo & Spring 2006) and toward providing solutions (e.g., in the IT sector) is acknowledged and observed to shape the specific markets. Furthermore, this study focuses on both consumer and business services but adopts the perspective of business organizations (market actors) and their nets. Hence, the customer, as denoted in the study, may refer to business customers or consumers.

1.6 Research design

Next, the research design of the study is presented. A research design is the logic that links the empirical data to the initial questions of the study and ultimately to the conclusions (Yin 2003). Easton (1995) describes a research choice framework as the hierarchy of decisions required to execute a research project. This hierarchy includes decisions concerning the epistemology, methodology, and research methods as well as the ontology, axiology, context, and constraints. In the following section, the chosen research strategy for studying the use of business models is discussed followed by a short introduction to the empirical setting of the study. A more detailed description of the methodological choices is presented in Chapter 4.
1.6.1 Research strategy

The present study follows a moderate constructionist research paradigm and a relativist ontological position (Järvensivu & Törnroos 2010) complemented by a subjectivist epistemological orientation (Denzin & Lincoln 2000a). As the philosophical position or a research paradigm (Guba & Lincoln 1994) guides the strategy of this study, this piece of research studies the subjective social realities through multiple viewpoints of knowledge, local truths (Järvensivu & Törnroos 2010), and through the activities and concepts of human beings or the artifacts they generate (Gorski 2013).

An abductive research strategy (see e.g., Dubois & Gadde 2002, Kovács & Spens 2005), often used in both critical realism and constructionism (Järvensivu & Törnroos 2010), guides the use and role of theory and empirical elaboration in answering the research questions of this study. Based on moderate constructionism and the abovementioned assumptions of the study, the research approach of the present study is qualitative. This study is interested in the dynamic, processual, and interactive nature of business models instead of their mere structure. The research objective is to understand the phenomenon (here, the use of business models), which requires a research approach that allows the phenomenon be studied closely, longitudinally, and within its context (Das 1983, Gilmore & Coviello 1999). The context of the study, illuminated through its empirical setting, is described next.

1.6.2 Empirical setting of the study

The empirical setting of the study is based on two research projects in which the researcher has been involved. In both projects, the focus was on developing new services, in which technology is a central element. Hence, the research setting consists of different types of market actors developing and testing technology-based services. Therefore, the projects provide a unique setting for collecting empirical data on the use of business models in emerging technology-based service context. In the following section, the empirical setting for the two projects is described in more detail.
UBI service pilot

The UbiLife research project took place in 2008–09. The project group, also referred to as a service development net consisting of research organizations, companies, and non-business actors, deployed a new and ubiquitous service infrastructure and developed novel ubiquitous (UBI) service applications. A Living Lab approach was taken so that users could participate in the design of the proof of concept pilots, which were then empirically evaluated by conducting field trials in real-life settings and with real end users. Assorted services were integrated into large-scale pilots presented to the general public. The first UBI pilot was organized during the summer of 2009 in the city center of Oulu, Finland. In the pilot, the city center represented a smart urban space where a new computing infrastructure was built.

The ubiquitous service infrastructure and service applications developed and tested in the UBI service pilot represent emerging technology-based services, which are not yet available in the market, but their future potential and markets are to be explored. The users testing the services in the city center did not have previous experience using such services, and there were no clear business models for the future, after the project’s end. Therefore, the pilot represented a unique empirical setting in which the use of business models could be studied in an emerging technology-based service market.

IT service development

The ProForm research project took place in 2010–11. The project involved four company partners developing new IT-based service offerings. Three of the companies operated in IT markets, and one was a more traditional manufacturer. Each company had their own development project, in which they were developing their service business and a specific service offering in collaboration with their customers and partners. All services under development employed technology in some form.

The individual development projects progressed differently; some progressed more systematically with co-development and testing of the service with the customer and potential end-users, while others did not progress on schedule. The researcher was able to follow these projects during the two-year period and was thus able gain unique data on the actions of the different market actors (the companies, their customers, and their partners) in developing a new service
offering. In the UbiLife project, the different actors involved in the project took part in co-developing the services but with no clear ‘owner’ for the developed infrastructure or the services or a clear business model. In the current project, each of the companies were in the process of developing their own business and service offerings, and hence, the perspective is strongly based on the companies. In addition to developing a new service, the companies were interested in developing or even transforming their business from a product orientation to a service orientation. Therefore, the project allowed for the current business models of the companies, their current markets, and the way those markets might be changed through the use of business models in their development projects to be studied.

1.7 Structure of the study

The thesis consists of two parts. The first part includes six chapters that answer the research objective of the study through the individual research papers. The thesis begins with an introduction that presents the background on the topic of the study, namely, the variation in the use of business models. In addition, the research topic is both justified and theoretically positioned. The research design, including a short introduction of the philosophical positioning, the research strategy, and the empirical setting, are described briefly at the end.

The second chapter, “Emerging technology-based services”, discusses the specifics of the context of the study and its implications for the phenomenon. An understanding of the nature of technology and technology-based services is provided based on the literature.

The third chapter, “Theoretical framework of the use of business models”, presents the theoretical underpinnings of markets and business nets in addition to the business model concept. During the research process, the understanding of the researcher evolved and, accordingly, the theoretical background was developed. Therefore, the literature review overlaps to some extent but is also broader than in the original research papers. The market conceptualization is mainly based on the contemporary work of the market studies group as opposed to the more classical view of marketing on markets. The business net conceptualization is based on the wider network approach, which is divided into the INA, strategic networks and alliances, and nets (focal, strategic, business, and value nets). The business model literature, comprising a wide range of fields and being highly fragmented, is divided into two sections. First, the essence of business models is discussed to
provide a basis for the thesis. Second, the activities of business models are discussed, drawing also on other literature streams, such as business opportunities and framing. The chapter concludes with a theoretical framework of the use of business models.

The fourth chapter, “Methodology”, describes the methodological choices of the study. The chapter starts by discussing the philosophical positioning of the study in more detail. Then, the overall research process, multi-method approach and longitudinal research design are described. This discussion is followed by a description of the data collection and analysis.

The fifth chapter, “Overview of the papers”, provides a summary of each of the individual papers, describing the concepts used, literature streams used, and empirical research conducted. Moreover, a brief description of the main results and conclusions is provided.

The final chapter, “Discussion”, provides an answer to the main research question by addressing the three sub-questions. The theoretical and managerial contributions of the study are discussed, and the study is evaluated. Finally, the limitations of the study and future research suggestions are discussed. The second part of the thesis presents the three original research papers.
Emerging technology-based services

In this chapter, the context of the study, namely, the emerging technology-based services, is introduced in more detail. First, the nature of technology and its implications for business and markets are discussed. Then, a distinction in technology-based services is made between ubiquitous and IT services, which in this study are the empirical examples of such services.

2.1 The nature of technology

“Technology and technological development are constituent components in the progress of society: economic growth, industrial change, and social development” (Håkansson & Lundgren 1995: 291). However, what is technology? It is by no means a simple question that can be answered comprehensively in this study. However, some types of premises for technology need to be established. Brian Arthur (2009: 28, 51) has performed praiseworthy work on creating an extensive but comprehensible understanding of the nature of technology and has presented three key definitions of technology. First, technology is “a means to fulfill a human purpose”, and more specifically, it is “a phenomenon captured and put to use”. Therefore, technology cannot exist without natural phenomena, but it consists of certain phenomena programmed for some purpose. Second, technology is “an assemblage of practices and components”, meaning that technology always consists of collections of individual technologies and practices. Third, technology is a “collection of devices and engineering practices available to a culture”, referring to the collective nature of technology.

All these considerations are helpful in understanding the premises and prerequisites of a technology-based service context for studying the use of business models. Technology itself affects the evolution of the market and thus establishes certain prerequisites for business models. According to the definitions presented by Arthur (2009), technology is always related to humans exploiting phenomena for certain purposes, which also makes it a sociological phenomenon. Technology consists of various components. To exploit technology, e.g., in a business model, such components, devices, and practices are most likely needed from various market actors forming networks.

Christensen (1997: xiii) defines technology broadly as “the processes by which an organization transforms labor, capital, materials, and information into
products and services of greater value”, and hence, it could be claimed that all companies employ technologies. Still, not all companies develop and produce technologies. Thomas and Ford (1995) consider technology to be applied ability; it is not simply the possession of knowledge but the ability to apply that knowledge to a specific problem. The possession of the ability is only of value to a company when it can generate profit by solving a problem for another company; connecting technology with markets. They distinguish three types of technology: product, process, and marketing technologies. It is unlikely that a single actor possesses skills to produce in all three types of technology. Thus, multiple actors are needed to develop, produce, and market technology-based services.

Srinivasan (2008: 633) believes that emerging technologies have “the potential to create a new industry or transform an existing one”. Arthur (2009: 191) acknowledges this potential as well, stating that the “economy mirrors the changes in its technologies”, thus altering its structure. This view supports the idea that technology (or a business model based on specific technology) has the power to shape or change the market. Let us ponder this idea more thoroughly.

Technologies are constantly evolving, building on existing technologies and creating new combinations of technologies (Arthur 2009). Previous research has attempted to understand this evolution of technology and its effects on the economy and society. For example, numerous distinctions have been made between radical and incremental technologies (see e.g., Day et al. 2004, Dewar & Dutton 1986). According to Arthur (2009), technology evolves as a result of new combinations of technologies. However, radical technologies often emerge from new technologies, whereas incremental technologies arise from the convergence of existing technologies (Srinivasan 2008). Radical innovations can be characterized as “revolutionary changes in technology”, representing clear differences in practices, whereas incremental innovations are minor improvements or adjustments in existing technology (Dewar & Dutton 1986: 1422).

How, then, does this change or evolution (whether radical or incremental) occur? Technological change has been characterized as a “bit-by-bit, cumulative process until it is punctuated by a major advance”, or a discontinuity (Tushman & Anderson 1986: 441). Therefore, technological change occurs in increments, with occasional radical innovations. At one extreme, the evolution of technology has been claimed to be a process of self-creation, where new technologies are constructed based on existing technologies; these technologies, in turn, provide the building blocks for the construction of other new technologies (Arthur 2009).
Of course, technological developments are also a sociological phenomenon. Technological progress occurs through the interaction among various market actors (Tushman & Anderson 1986). One way of perceiving this type of process is the technology life cycle model presented by Afuah and Tucci (2001). In the emerging or fluid phase, there is considerable product and market uncertainty; neither companies nor customers know what they want form the products. Different actors interact with each other and make the initial decisions concerning their network positions. There is competition between old and new technologies as well as designs using the technology. Market penetration is low with lead users or high-income users as customers. In the growth or transitional phase, the standardization of components, market needs, and product design features takes place, and a standard or a dominant design emerges. The customer base increases to a mass market. Companies need to determine where to excel or reinforce and build upon their success. In the mature or stable phase, standardized products proliferate and demand growth slows. Companies focus on defending their competitive positions and anticipating future technological changes. Although it offers valuable insights into the phases of technological development, the above-described evolution path is rarely this linear and does not proceed to the growth phase with mass markets. This is where the need to understand the nature of markets is critical.

In addition to combining suitable parts and functionalities to form technological solutions, Arthur (2009) identifies need as a key driving force behind the evolution of technology. Needs are derived not only directly from human wants but also from limitations and problems encountered with technology itself. Thus, the evolution of technology can be characterized by the interplay between solutions and needs. Accordingly, the economy and markets are in a constant flux. According to Tushman and Philip (1986), changes in technology result from the interplay between history and individual and market demand. Srinivasan (2008: 636) acknowledges that “the power of creative combinations of new and old technologies, new and old methods of producing products, and business models can open up entirely new markets, while destroying current business models and markets”.

In attempting to understand the dynamics of technology and related markets, an acknowledged way to create stability in the market is through the development of dominant designs. Dominant designs emerge from the competition among several designs; they, therefore, affect the market and the technological evolution, the performance of firms, and eventually the market structure (Srinivasan 2008).
Dominant designs reflect the emergence of product category standards and the end of the period of ‘technological ferment’ (Tushman & Anderson 1986: 441). Dominant designs often consist of numerous standards but are still distinguished from standards (although these terms are often used interchangeably) (Srinivasan 2008). Srinivasan et al. (2006) define standards as having a functional purpose, referring to technical specifications for quality, compatibility, adaptability, and connectivity. A key distinction is made based on market acceptance: standards in the product category are independent of market acceptance, whereas for dominant designs, market acceptance is an integral aspect. It has been claimed that the emergence of dominant designs affects firms’ strategies and performance as well as markets (Srinivasan et al. 2006). However, in many fields, the emergence of dominant designs is a long process, and despite creating technological innovations, many companies fail commercially. Christensen (1997) discusses the problems that companies face with disruptive technologies, referring to the innovator’s dilemma. Strategies and plans formed for existing markets do not apply to the market for a new technology because the market may not exist.

It is challenging but critical for companies’ survival for companies to have the right devices and engage in the right types of activities (either before or after the emergence of dominant designs). For example, firms must be able to sense and respond to new technologies; firms must be able to engage in technological opportunism (Srinivasan et al. 2002). Sensing and responding to technological changes consists of two types of activities. Sensing technology refers to an ability to acquire knowledge about and understand new technological developments and thus to be able to identify, sense, and assess internal innovations and scan for external innovations by encountering different parties, such as vendors, salespeople, and competitors (Srinivasan et al. 2002: 48). However, although an organization may sense new technologies, it may not be willing to respond to them. Hence, responding to technologies is crucial, and such a capability indicates the willingness and ability of an organization to respond to the new technological developments it senses and to modify and adapt its business strategy to exploit the opportunities arising from the new technology (Srinivasan et al. 2002). To respond to technological changes, a company must make decisions concerning its strategy and transform them into activities. A company may choose to ignore the technology, monitor it, form alliances, perform experimentation, or adopt the technology within the firm (Srinivasan et al. 2002). Once a decision to engage in technological developments has been made, it is critical to understand how the company proceeds to create technology-based services in the dynamic market.
2.2 Technology-based services

According to some definitions (see e.g., Arthur 2009, Christensen 1997), even business organizations and monetary systems can be considered technologies that fulfill certain purposes. However, to narrow down the definition of technology, this research limits its focus to advances in IT and the recent efforts in ubiquitous computing, which have been a source for changes in markets and have affected the operations of many organizations (cf. electronic business and digitization).

This study examines novel services that utilize technological developments in some way (instead of technology-based products). Increasing competition and growing customer demands are driving companies to develop new technology-based services to stay competitive (e.g., Matthing et al. 2006). A strong shift from physical products to services has occurred (Jacob & Ulaga 2008, Oliva & Kallenberg 2003). Service-based business is considered to provide a competitive advantage for companies operating not only in the IT market but also in more traditional industries such as manufacturing (see e.g., Araujo & Spring 2006). However, by emphasizing services, the aim is not to distinguish physical goods or products from non-physical services. Instead, a technology-based service is acknowledged to contain both physical and non-physical elements. Therefore, both software and hardware can be included in a technology-based service as simply two dimensions of technology: software is a sequence of operations, a process, or a method that requires hardware, namely, physical equipment to execute the sequence (Arthur 2009).

In the following two sections, the two specific fields examined in this study—ubiquitous computing and related services and IT and related services—are briefly discussed.

Ubiquitous services

Mark Weiser (1991) was among the first to introduce the concept of ubiquitous computing, emphasizing the idea of technology disappearing into the background of our everyday lives. He created a vision of ubiquitous computing of people and environments augmented with computational resources providing information and services whenever and wherever. Weiser’s vision was ambitious, and it has been criticized to a large extent. Research in the field of ubiquitous computing has failed to produce visible results, and the ubicomp research community has failed to create its own theoretical framework (see e.g., Bell & Dourish 2007, Sharp &
Rehman 2005). However, previous research has mainly focused on the
technologies that are required to establish the ubiquitous computing environment
(Jeon et al. 2007), disregarding other aspects of such an environment.

Recently, there have been efforts to apply the ideas of ubiquitous computing
to, e.g., urban spaces (see e.g., Kukka et al. 2013). In such spaces, computers are
embedded in our natural movements and interactions with our environments, both
physical and social (Lyytinen & Yoo 2002). A more recent development in
making computing truly ubiquitous is the introduction of the IoT (Mattern &
Floerkemeier 2010), a new paradigm in modern wireless telecommunications that
integrates several technologies and communication solutions (Atzori et al. 2010).
‘Smart objects’ are at the center of the IoT. These objects are the physical devices
that are connected to the Internet and that thus bridge the gap between the
physical and information worlds (Kopetz 2011). The real-time interpretation of
data from the physical world allowed by the IoT will enable the development of
novel business services and may deliver substantial economic and social benefits
(Mattern & Floerkemeier 2010).

The physical and social dimensions are critical in ubiquitous services and in
the IoT in general. Because ubiquitous computing changes the way people access
and use services, creating new classes of services embedded in the environment, it
has been suggested ubiquitous computing would lead us to a world of ubiquitous
commerce (Fano & Gershman 2002). Ubiquitous commerce has implications for
the nature of communication, competition, market structures, marketing, and
business models (Galanxhi-Janaqi & Nah 2004). Thus, ubiquitous commerce
provides many opportunities but may also be a threat to some industries (Watson
et al. 2002). The IoT paradigm also requires technological and social aspects to
be linked (Atzori et al. 2010) by conforming to general social and political
expectations, being widely applicable and taking economic considerations into
account (Mattern & Floerkemeier 2010).

In developing ubiquitous services, there are several tasks to address, such as
understanding the everyday practices of people, augmenting the world through
the provisioning of heterogeneous devices, and, finally, orchestrating the
networked devices to provide a holistic user experience (Abowd & Mynatt 2000).
Emerging technologies associated with ubiquitous computing offer new ways to
achieve awareness, new channels for accessibility, and new techniques for
responding. These technologies ultimately change the way businesses and
consumers can access each other and radically change the nature of customer
relationships (Fano & Gershman 2002). Therefore, ubiquitous computing and the IoT paradigm have an effect on market actors and markets.

**IT services**

IT can be viewed from various perspectives, such as social construction, information provision, infrastructure (including software and hardware), and business processes and systems (Brady *et al.* 2002). Information and communications technology (ICT) are often used interchangeably with IT. A more recent development in the IT field is the introduction of cloud computing, which emphasizes software as a service (Armbrust *et al.* 2010), eliminating the need to maintain expensive computing hardware (Ostermann *et al.* 2010). Cloud computing services allow users to temporarily utilize the computing infrastructure over the network (Youseff *et al.* 2008). Three types of cloud computing services can be distinguished: Infrastructure-as-a-Service, Platform-as-a-Service, and Software-as-a-Service (e.g., Ostermann *et al.* 2010).

In this study, the term IT service is used to refer to services employing IT, ICT, and cloud computing expertise. IT services, as defined in this study, can cover different software, hardware, telecommunications, and information management techniques, applications, and devices (Brady *et al.* 2002). IT services can be provided for consumers (Kristensson *et al.* 2008, Matthing *et al.* 2006) and business customers (Hyötyläinen & Möller 2007). Under the wide spectrum of IT, the ubiquitous services introduced earlier can also be considered a type of IT service. However, they are distinguished as an empirical setting of this study to emphasize the nature of what is believed to be another phase in technological development, similarly to e-business and m-commerce.

Such developments in IT have been acknowledged to drive societies (Pipe 2004), economies (Antonelli 1998), business markets, networks, and relationships (Leek *et al.* 2003, Nyström 2009), as well as the business processes of companies (Brynjolfsson & Hitt 2000, Hyötyläinen & Möller 2007). IT services can be characterized as complex due to the continuous developments in the underlying technologies (Hyötyläinen & Möller 2007). A range of IT resources and capabilities are needed to contribute to the business performance of companies, such as technical IT skills, generic information technologies, IT investments, shared knowledge (e.g., managerial IT skills), IT infrastructure, and IT complementarities (Ray *et al.* 2005). Because of the wide range of resources,
single companies can rarely master all the relevant competencies but rather need to cooperate with other market actors to develop IT-based service offerings.

It should be noted that this study does not consider in detail the technological aspects themselves but rather focuses on the implications on markets, networks, and market actors that technology and technology-based services bring about. These characteristics are, for example, the high degree of uncertainty, dynamics involving continuous changes and developments in the business environment, and the resources and competencies needed from various actors to develop and market technology-based services. The specifics of the market are discussed in the next chapter together with the other key theoretical constructs of business nets and business models.
3 Theoretical framework of the use of business models

This chapter continues with the key theoretical discussions used in the study on markets, business nets and business models. The chapter begins by discussing the nature of markets based on traditional versus more contemporary marketing thought. The chapter continues with introducing the industrial network approach, which is followed by a discussion of strategic networks and business nets, proceeding from a higher level of scrutiny toward a more specific, limited focus of the study. Then, the business model literature is reviewed, discussing the essence and activities of business models. Hence, the chapter first discusses the theoretical premises separately before combining them into a theoretical framework of the use of business models, providing a preliminary conceptual answer to the research problem. The framework is then elaborated based on the empirical research.

3.1 Markets

It is now clear, based on the considerations in the previous chapters, that technology-based service markets are in constant flux: “the only certainty with the emerging technologies is the high degree of uncertainty” (Srinivasan, 2008: 634). Hence, “markets are always in the making” (Kjellberg et al. 2012: 220). This section elaborates upon the extant literature regarding the nature of markets addressed within the marketing discipline and how this helps us understand the dynamics of markets.

Much of the previous research on markets has evolved around the construct of ‘market orientation’ (Kohli & Jaworski 1990, Narver & Slater 1990), which has played a major role in marketing theory. It has been claimed that market-oriented companies perform better with increased sales and profitability (e.g., Jaworski & Kohli 1993, Narver & Slater 1990). Market orientation has been defined in various ways, resulting in diverse views among academics and practitioners. A company’s market orientation can refer to the generation of market intelligence, the dissemination of the intelligence in the organization, and the organization-wide responsiveness to the intelligence that is generated and disseminated (Kohli & Jaworski 1990). According to Narver and Slater (1990), however, market orientation consists of behavioral components: customer orientation, competitor orientation, and interfunctional coordination. The
previously recognized antecedents of a market orientation are mainly internal to the organization, such as the role of top management, interdepartmental dynamics, and organizational systems (Jaworski & Kohli 1993). Market orientation has also been conceptualized as a firm-level resource (Menguc & Auh 2006), with market-sensing and customer-linking capabilities embedded in the organization (Day 1994). Such a capability perspective has been suggested to facilitate the understanding of the creation of market orientation (Foley & Fahy 2004).

However, there is evidence of many companies failing to develop and sustain market orientation (Day 1994, Mason & Harris 2005). One explanation for these failures may be the misleading and inaccurate views of the level of market orientation that managers develop in their companies (Mason & Harris 2005). Indeed, market orientation mainly focuses on the inside of the firm (Tuominen et al. 2004), as an internal capability or an organizational resource to be able to sense and act on changes in the market (Day 2002). This approach to markets is rather reactive and emphasizes the internal perspective of companies that are either market driven or not.

Market orientation tends to rest on the assumption of markets as given, where firms follow their customers but challenges occur when the market does not yet exist or is being radically redefined (Schindehutte et al. 2008). In response, there have been developments in research toward a more dynamic view of markets, labeled as ‘market driving’. According to Jaworski et al. (2000), market driving explains how firms influence the structure of a market or the behavior of market actors. Driving the market structure refers to a business changing the composition of the market actors or the roles of the actors, whereas shaping market behavior refers to educating customers of previously unconsidered attributes of the offerings (Jaworski et al. 2000). Thus, organizations reshape, educate, and lead their customers and, ultimately, the market (Harris & Cai 2002). Another view on market driving is more internal to the organization, emphasizing innovation in the value proposition and the business system (Kumar et al. 2000).

The extant literature has identified different types of market driving strategies or aspects that managers can choose to pursue. Jaworski et al. (2000) classify ways of changing the market structure as deconstruction (eliminating players in a market), construction (building a new or modified set of players), and functional (changing the functions of players). Harris and Cai (2002) identify four principles of market driving: market sensing (generating market understanding to alter the market), changing customer preferences (educating customers to alter public
opinions and preferences), relationship formation (with not only customers but also other market actors), and local sensitivity (to unique cultural conditions).

Harris and Cai (2002) explore the conditions for market driving. Two factors, customer familiarity and preconceptions of product characteristics, as well as the extent of market control, seem to be strong drivers of the adoption of a market driving approach. This view seems to indicate that market driving is successful only in certain contexts, whereas the market driven approach is still successful in other contexts. Indeed, a company can be both market driven and drive markets, e.g., when simultaneously protecting an existing business with old technology and building a business with new technology (Jaworski et al. 2000). Market driving has been considered to be particularly pertinent for companies operating in technology-based markets (see Mohr & Sarin 2009) where changes in technology are continuous.

A more recent stream of literature on market dynamics is the market studies (e.g., Araujo et al. 2010a, Kjellberg & Helgesson 2007, Kjellberg et al. 2012). The market studies literature calls for a refocus regarding the conceptualization of a market (Mason, 2012) and examines markets in the making rather than existing markets (Kjellberg & Helgesson, 2007). “Markets are not, they become” (Kjellberg et al. 2012: 220). This statement is especially true in the emergence of new technology and related services. The basic assumption has been that customers are to be identified in existing markets, whereas a more interactive approach calls for constructive segmentation to shape the market and thus expand the view of descriptive aspects to include constructive aspects (Harrison & Kjellberg 2010). Construction is the key in market studies. According to Araujo (2007: 212), “the construction of markets is an accomplishment that depends on the mobilization of varying bodies of expertise and calculative agencies, including marketing practices”. It can be assumed that markets are constructed by multiple market actors trying to influence the actions of others in the market. Callon and Muniesa (2005: 1230) define markets as “collective devices that calculate compromises on the value of goods”. Market actors need to create enough stability and shared understanding to enable the actors to change the market. Thus, market practices can be considered attempts to institutionalize but at the same time reshape existing arrangements (Araujo 2007) for changes to take place. However, the question remains, how can this be done?

In the market studies literature, markets are conceptualized as being constituted by practice (Kjellberg & Helgesson 2006, Kjellberg & Helgesson 2007) and are thus continuous results of market practices (Kjellberg et al. 2012).
Kjellberg and Helgesson (2007) distinguish three interlinked types of practices: normalizing (establishment of normative objectives), representational (depiction of markets), and exchange (realization of economic exchanges). These practices include multiple ideas and multiple realities, which are maintained and interrelated through chains of translations of abstraction and concretizing (Kjellberg & Helgesson 2006). The ideas, strategies, or business models that the market actors hold are translated into market-shaping practices and activities (and vice versa).

This study adopts the perspective adopted in market studies regarding markets, and markets are understood as emergent social constructions (see Mason 2012) consisting of the activities that different market actors perform based on their ideas of the market. It is also critical to be able to imagine future markets in the field of technology due to the rapid developments in the field. Whereas market orientation emphasizes serving a recognized market based on existing market descriptions and the market driving approach considers new and emerging markets, the view of markets as constructions considers market actors to not only be able to induce change in the market but also plan future markets and make them a reality. This dynamic can be critical in technology-based markets, where changes are constant and many actors fail to connect their innovations with a market successfully.

Technological heterogeneity and the fast pace of technological change have been identified as key features of high-technology markets (Weiss & Heide 1993), features that pose considerable problems for market actors due to the high uncertainty in the market (Heide & Weiss 1995). Technology evolves through a series of incremental changes punctuated by technological breakthroughs, namely, discontinuities enhancing or destroying the competencies of firms and thus causing further uncertainty in the market (Tushman & Anderson 1986). In a similar vein, Christensen (1997) discusses sustaining and disruptive technological innovations. Arthur (2009) uses the concept of structural change: novel technologies entering the market (or economy in general) call for novel arrangements in technologies and organizational forms. Such new arrangements may cause new problems. All these dynamics proceed in a sequence of problem and solution, challenge, and response.

Of course, there have been attempts to forecast technology trends. In 2002, Kalakota and Robinson identified five structural changes in the market during the previous two decades. The first two, systems integration and business integration, required major internal readjustment within companies. Furthermore, since 1995,
there have been three major structural shifts: e-commerce, e-business, and m-business. Mobile computing represents applications that exploit the advances of ubiquitous computing. These researchers note that these changes have not been merely internal; they have also affected the boundaries of corporations.

Companies need devices to address the uncertainty and continuous changes within the market and to bring about these changes, taking into account the internal as well as external actors in the market. In addition to sensing and responding to technological changes, Srinivasan (2008) calls for ‘market experimentation’ strategies. O’Connor and Veryzer (2001) identify different ways of learning about the future market in developing radical innovations. First, experiential interaction with customers, mainly lead users, can be a valid approach. Second, researchers have offered several tools for predicting the future of marketplaces for advanced technologies, such as scenario planning, core driver mapping, and science and technology mapping. Third, technological development can be linked to potential markets, e.g., by backcasting. Companies can learn about their markets through market sensing and sense making (Day, 2002). Mason (2012) identifies four distinct bundles of practices employed by managers to make sense of markets: sensing, sense making, framing, and reflecting. Day (2002) identifies different devices for organizations to open their collective ‘mind’ to new information that can help forecast the responses of the market in changes in strategy. These devices include creating a spirit of open-minded inquiry, carefully analyzing competitors’ actions, listening to staff on the front lines, seeking out latent needs, actively scanning the periphery of the market, and encouraging continuous experimentation.

While all these factors are important, this study argues that business models can be used by market actors to anticipate emerging opportunities and threats in the market and, accordingly, to plan and shape the future market in cooperation with other market actors. However, before addressing the use of business models, the next chapter first focuses on the network approach.

### 3.2 Network approach

Two decades ago, Thomas and Ford (1995: 272) identified a shift from “a view of technology and technology development as something inside the firm or within its exclusive control and towards a view of the effects of technology and its development as being one of interaction between firms”. An individual firm facing technological landscapes characterized by multiplicity, variety, and
ambiguity is embedded in the socio-technical structure, or an industrial network, and the outcome of its innovation activities depends how it is connected to the activities of other companies (Håkansson & Lundgren 1995). Håkansson and Olsen (2012) discuss innovation and business development as interactional, networked, and systemic phenomena in today’s networked economies. Moreover, Cunningham (1995) emphasizes the strategic uncertainty of new-technology markets, which are characterized by the high rate of technological innovation, the convergence of technologies and new entrants from different origins. The changing character of markets from market transactions and short-term dyadic relationships to long-term relational exchanges and networks has been affected by, among other factors, technological development (Möller & Wilson 1995). It has been claimed that markets are being replaced by networks (Möller & Halinen 1999), and competition is increasingly taking place more at the level of networks instead of single firms (Kothandaraman & Wilson 2001). Indeed, the competitive landscape is changing, and markets can be considered to consist of complex networks of relationships between market actors as an attempt to cope with market uncertainty. Thus, networks can be considered a strategic organizational response to the dynamic market pressures (Cravens et al. 1996), and in most markets, there are typically a number of competing networks (Thorelli 1986). To understand the multiplicity of actors forming networks in the emerging technology-based service market, this study begins by reviewing the industrial network approach (INA).

3.2.1 Relationships and networks

According to the INA, markets consist of relationships between actors (instead of single exchange episodes and transactions) (Håkansson & Snehota 1995). Business relationships are especially important in industrial markets. The interaction approach emphasizes long-lasting business relationships between market actors based on interaction, which create stable market structures (see Håkansson 1982). Over the years, a wide range of characteristics of interorganizational relationships have been identified: 1) relationships have a long-term orientation; 2) relationships change and, hence, are not static; 3) barriers block the development of relationships, and hence, relationships require investments; 4) relationships have an atmosphere of power dependence, conflict or cooperation, and closeness or distance; and 5) relationships are mainly maintained for economic purposes (Ritter & Gemünden 2003a). Furthermore,
relationships enable companies to cope with technological dependence and the need to develop offerings for more specific requirements (Håkansson & Ford 2002). The business relationships of an organization with different actors represent strategic resources in three ways: 1) a company’s relationships are important resources in themselves; 2) direct relationships connect a focal company to the network; and 3) relationships combine the physical and organizational resources between organizations (Gadde et al. 2003). In the interaction between actors, “their problems are confronted with solutions, their abilities with needs”, and thus, their identities are created in their interactions with others (Håkansson & Snehota 2006: 260).

However, the focus of research has moved from relationships toward a broader structure due to the discovery of connectedness (Ritter & Gemünden 2003a). Connections exist among relationships: no interaction can be understood without the relationship of which it is a part (Håkansson & Ford 2002). Therefore, greater attention needs to be paid to the embedded network context within which relationships take place (Anderson et al. 1994). Halinen and Törnroos (1998) use the concept of embeddedness to describe the broader connectedness of actors and dyads of actors in a variety of networks. Because business relationships are connected, and thus part of a larger structure, namely, a network, the network does not have a center or clear boundaries (Håkansson & Snehota 1995). According to Thorelli (1986: 38), “the entire economy can be viewed as a network of organizations with a vast hierarchy of subordinate, criss-crossing networks”. Håkansson and Ford (2002: 133) define the network in its most abstract form as “a structure where a number of nodes are related to each other by specific threads”. The network is a number of positions maintained by different actors and can be illustrated by a number of rings (actors) connected by a number of lines (relationships) (Axelsson 1992). Easton (1992) describes networks using four metaphors: relationships, structures, processes, and positions. A network may be considered through relationships that comprise four elements: mutual orientation, dependence, bonds, and investments. Network structure refers to the interdependence among the actors. A network may also be viewed as an aggregation of the interlocking positions that the actors hold. Network processes, such as competition and cooperation, refer to change in the network, and they are dominated by the distribution of power and interest structures.

The model of industrial networks, known as the ARA model, consists of actors, resources, and activities (Håkansson & Johanson 1992). Håkansson and Johanson (1992) describe these three components as being related to each other in
the overall structure of the network. Actors are those who perform activities and/or control resources. Activities refer to the use of resources to change the resources of other actors. The development of relationships can be explained by these three factors (Håkansson & Snehota 1995). By applying this model, two processes can be identified: the continual refining of ways to combine activities and resources (structuring) and finding new ways to combine activities and resources (heterogeneity) (Axelsson 1995). Network structures and processes affect and are affected by technological development (Thomas & Ford 1995).

The extant literature has identified different levels and classifications of networks and relationships, e.g., based on management issues. For example, Möller and Halinen (1999) distinguish among four levels of managing relationships and networks. Level one, industries as networks, depicts industrial and social networks as the contextual domain of individual organizations, whose behavior is interrelated with network behavior. Level two, managing focal nets and network positions, emphasizes the need to understand how the organization relates to its environment. Level three, managing relationship portfolios, refers to the management of a company’s exchange relationships concerning the internal management of resources, capabilities, and activities. Different types of customers and suppliers require different types of management mechanisms. Level four, the management of exchange relationships, refers to the management of core elements in the relationship and the contextual factors influencing the interaction in the relationship. Ritter and Gemünden (2003a) identify four management levels based on actors in the network: the individual, a group of individuals, the organization, and a cluster of organizations.

In addition to different management levels, there have been attempts to classify levels of analysis. Ritter and Gemünden (2003a) distinguish among different inter-organizational levels of analysis: the interaction/episode, the dyad/individual relationship, the portfolio/similar relationships, the net/relationships of an actor, and network/industries and markets as networks. Mattson (1997) calls these levels micro (dyad), meso (net), and macro (markets as networks). Halinen and Törnroos (2005) distinguish among intranet, actor-network, dyad-network, and micronet-macronet perspectives.

From the above classifications of networks and relationships, it can be noted that larger networks can be divided into smaller entities. This study focuses on nets, which can also be considered strategic networks. The notion of strategy has not been the main concern in research on industrial networks, but strategizing is a
fundamental issue in IMP research (Gadde et al. 2003). Collaborative technological activities are deliberate acts by companies chosen for strategic purposes (Thomas & Ford 1995). Håkansson (1987) emphasizes the importance of networks in innovation via three processes: knowledge development, resource mobilization, and resource coordination. Hence, the network is a source of ideas as well as a vehicle for the transmission of ideas. When introducing new technology, the originator of the new product technology may not possess the skills to manufacture or to market and sell the application, and hence, it needs to assess which skills it will develop by itself and which skills it will rely on others to obtain (Thomas & Ford 1995). Gemünden et al. (1996) acknowledge the need for different types of actors contributing specific resources and know-how for companies’ innovation processes. Indeed, the development of competitive offerings in ICT markets often requires a coalition among platform and service providers, and hence, building a strategic network is critical (Partanen & Möller 2012). As can be noted from the above discussion, a variety of actors are needed for the development, production, and marketing of new technology and technology-based services. In the following section, research on strategic networks and business nets is reviewed in detail to understand such smaller groups of actors with a shared goal and understanding within larger networks and markets as opposed to networks with neither a clear center nor clear boundaries (see Håkansson & Snehota 1995).

3.2.2 Strategic networks and business nets

The terms ‘strategic alliances’, ‘joint ventures’, ‘strategic networks’, ‘collaborations’, and ‘partnerships’ are mentioned repeatedly in the broad range of literature on relationships and networks (e.g., Cravens et al. 1996, Håkansson & Ford 2002, Möller & Halinen 1999, Ritter & Gemünden 2003a). However, what is the difference between industrial and strategic networks? Individual actors rarely possess all the necessary resources and capabilities to develop, produce, and market a new technology-based service. This study argues that the literature on strategic networks and business nets can provide a better understanding of the formation of relationships and networks among the actors to develop, produce, and market such services.

An increasing amount strategic management literature examines the importance of strategic networks in firm performance (e.g., Gulati et al. 2000, Zaheer & Bell 2005). Much of the previous research on strategic networks and
nets builds on the resource dependence or resource-based view of firms. This perspective considers the net through the eyes of a single firm, where the functioning of the network is of secondary importance (Easton 1992). From a network perspective, an actor is defined from an outside view (the network) instead of an inside perspective (the actor) in terms of the resources that they mobilize and the activities in which they are involved (Gadde et al. 2003). In strategic networks, a focal actor, also called a hub firm (Jarillo 1988), leads the network. Frear and Metcalf (1995) state that such leading actors are often technically or financially powerful.

From the perspective of a focal firm, there are both vertical (with customers and suppliers) and horizontal (e.g., alliances with competitors) relationships (Möller & Halinen 1999, Piercy & Cravens 1995). A strategic alliance or partnership can be defined as “a relationship where a synergistic combination of individual and mutual goals encourages the partners to invest time, effort, and resources to create a long-term collaborative effort that achieves individual and partnership strategic advantage” (Wilson & Möller 1995: 55). Strategic alliance refers to a future-oriented relationship between two or more independent companies, each attempting to leverage the strengths of the others toward a mutually beneficial goal (Spekman & Kelly 1995). Jarillo (1988: 32) conceptualizes strategic networks as “long-term and purposeful arrangements among distinct but related for-profit organizations that allow those firms in them to gain or sustain competitive advantage vis-à-vis their competitors outside the network”. Strategic networks are “composed of interorganizational ties that are enduring, are of strategic significance for the firms entering them, and include strategic alliances, joint ventures, long-term buyer-supplier partnerships, and a host of similar ties” (Gulati et al. 2000: 203). Such networks can give companies access to information, resources, markets, and technologies and allow firms to achieve strategic objectives such as risk sharing (Gulati et al. 2000). A strategic network is composed of a number of dyadic relationships, which are neither strictly competitive nor cooperative (or are simultaneously competitive and cooperative); rather, actors ally with each other to achieve common objectives (Gulati et al. 2000). What differentiates a relationship in a strategic network from a relationship in a typical market is the high degree of opportunities for joint value creation among the actors (Jarillo 1988).

Achrol (1997: 59) distinguishes a ‘network organization’ from simple networks of exchange linkages by “the density, multiplexity, and reciprocity of ties and a shared value system defining membership roles and responsibilities”.
Möller *et al.* (2005) also emphasize the centrality of the value system and its level of determination in understanding strategic nets. Value-creating systems can be defined as sets of activities that create value and that are connected to each other by flows of information, material, money, and influence (Parolini 1999). It is important to decide which parts of a value chain or a system of a given product are to be emphasized in a firm and which are to be farmed out (Jarillo 1988). Zaheer and Bell (2005) emphasize that the firm’s abilities to identify and exploit the resources in their network are critical for their performance.

The concept of the focal net has also been used to refer to the dyadic business relationship and its immediate business network, including direct and indirect relationships (Alajoutsijärvi *et al.* 1999). A focal net consists of those actors whom the management of the focal actor considers to be relevant and within the network horizon (Möller & Wilson 1995, Möller & Halinen 1999). A focal net mediates ‘macro’ forces, such as technological changes, on individual actors and mediates the effects of the actions of actors or dyads on the greater network environment (Möller & Halinen 1999). Ritter *et al.* (2004) use the term value net to refer to the relationships in which the focal firm is a direct participant, e.g., with customers, suppliers, competitors, and complementors, including inter- and intrafirm relationships.

The increasing competition among and complexity of technologies have forced companies to form strategic alliances with competitors and other actors, such as governmental agencies, universities, and research institutions (Möller & Halinen 1999). Relationships can be formed among corporate units, independent organizations, and entrepreneurs (Piercy & Cravens 1995). Gemünden *et al.* (1996) identify the most important types of innovation partners and their contributions to an actor’s innovation activities. In addition to buyers and suppliers, potential partners may be research and training institutes, competitors, distributors, consultants, co-suppliers, and administrations. Relationships and interactions with such market actors may be critical for the success of novel technology-based services. Through network competence, companies are able to intensively involve such actors in their technological development processes and thus share the burden of innovation (Ritter & Gemünden 2003b). Möller and Svaln (2009) discuss the birth of new business fields as lacking transparency without a clear market structure with identifiable actors; many types of actors are needed, such as those described above.

This study focuses on (strategic) business nets that contain a specific set of actors aiming to develop, produce, and market emerging technology-based
services. Such nets may be embedded in larger networks, and markets consist of several smaller nets. Single companies often lack sufficient resources to commercialize a new product. Consequently, the resources of other actors in the net facilitate both the development and commercialization of innovations (Aarikka-Stenroos & Sandberg 2012). The business net concept considers the net to be intentionally formed, with a limited number of parties involved, but it is still a new and emerging net that is formed to develop, produce, and market emerging technology-based services (Möller et al. 2005). Such an emerging net may evolve and change between the process of developing the service and the process of commercializing it, becoming a more stable business net in the process. Different types of nets as discussed in the extant literature are addressed in the following section.

3.2.3 Types of nets

Instead of considering the market as all-embracing networks or simply focusing on buyer-seller relationships, different types of nets may be formed for different purposes (e.g., supply nets, R&D nets, brand nets). Acknowledging and understanding the multiplicity of nets is important for understanding the dynamic nature of nets within the market.

Discussion on the nature of nets has focused on the manageability of the network. Networks and relationships provide the opportunity for a company to influence others, but at the same time, they are also a force for other actors to influence the company: “a network is both a way to influence and to be influenced” (Håkansson & Ford 2002: 136). Heikkinen et al. (2007: 910) define managing in a net as “a capability to influence the net” by mobilizing and coordinating the value activities of others. Gadde et al. (2003) discuss strategizing in industrial networks and present three strategizing issues for companies based on managerial paradoxes presented by Håkansson and Ford (2002). First, companies need to identify and establish appropriate levels of involvement in their relationships. Second, companies need to consider the balance of the interplay between influencing others and being influenced. Third, a company should aim to identify an adequate level of control in the network. The more companies achieve control in the network, the less effective and innovative the network is claimed to be (Håkansson & Ford 2002). In commercializing new products or services, an actor needs to access, mobilize, and organize relational
resources, and hence, cooperation in commercialization needs to be coordinated (Aarikka-Stenroos & Sandberg 2012).

Möller and Rajala (2007) argue that different types of nets require different types of managerial or governance solutions. Möller et al. (2005) identify three factors that explain the nature of business nets and their management: 1) the level of determination of the value activities and the actors forming the net, 2) the goal of the net or its hub firm in terms of the desired outcomes that are pursued through the net, and 3) the structure of the net, which can be described through the vertical and horizontal dimensions and through the numbers and different types of actors. Prior research distinguishes between different types of networks and nets, as discussed below.

Achrol (1996) identifies four types of network organizations—internal market networks, vertical market networks, intermarket networks, and opportunity networks—which can be arranged in a continuum with purer network forms when progressing from internal to vertical to intermarket to opportunity networks. All four network types are organized around a focal actor. However, an increasing number of networks are not organized around a single firm in a vertical manner (e.g., in developing a new technology, various companies cooperate, forming nets horizontally) (Möller & Rajala 2007, Möller & Halinen 1999, Piercy & Cravens 1995). Piercy and Cravens (1995) distinguish four types of network organization: hollow network, flexible organization, value-added organization, and virtual organization for different purposes. Partanen and Möller (2012) divide prior research on strategic networks into two categories: strategic multi-actor and hub-driven strategic networks. They state that hub-driven networks are more common for developing new offerings (also Möller & Rajala 2007).

Many previous network and net classifications neglect a key aspect in understanding networks: value-creation logic (Möller & Rajala 2007). Möller, Rajala and Svahn (2005) conceive a continuum of value systems composed of three ideal systems. The left end of the continuum describes clearly specified and stable systems, and the middle part describes value systems that are relatively well determined but are modified by incremental improvements. The right end of the continuum describes emerging value systems, which are created to develop and commercialize new technologies, products, or business concepts. Möller and Rajala (2007) propose three generic types of nets based on the value-system continuum: current business nets, business renewal nets, and emerging business nets. In the case of shaping and innovating markets for novel technology-based services, the domain of emerging business nets is critical (see Fig. 3).
Möller and Rajala (2007) identify three net categories in the relatively under-researched and complex domain of emerging business nets. First, innovation nets are mainly loose science- and technology-based research networks consisting of universities, research institutions, and research organizations of corporations. Second, in dominant design nets companies try to create dominant technological designs to favor their positions in the field. Third, application nets are formed to achieve commercially viable business applications out of the evolving technology. These nets are mostly driven by a hub firm and involve a web of component, software and other technology providers and pilot customers.

Related to technology markets, Cunningham (1995) also notes that network structures have different types of objectives and memberships. He identifies different types of nets in IT markets: competence enhancement nets, technological development nets, competitor appraisal nets, and information exchange nets. Aarikka-Stenroos and Sandberg (2012) also distinguish between R&D and innovation networks and networks (or nets) shifting toward commercialization. They emphasize the need to mobilize relational resources within the network to ensure the market acceptance of the new product or service; thus, the innovating actor may need to experience changes in its network relations. Moreover, new service development (NSD) nets have been a focus of prior research (Heikkinen et al. 2007).
Regardless of their purpose, such R&D, service development, and application nets are fundamental in the context of the current study, namely, the emerging technology-based service market, where the net needs to be transformed into a viable business net. Aarikka-Stenroos and Sandberg (2012) use the concept of commercialization net as a versatile net, consisting of both horizontal and vertical dimensions and both non-profit and for-profit actors who are able to create markets. The formation and evolution of business nets is discussed in the following section.

3.2.4 Formation of business nets

To understand how market actors can connect an emerging technology-based service with a market, the formation of the net of actors who develop, produce, and market such services and the ways in which the actors can coordinate and mobilize others in the net need to be taken into account. Change and stability in networks have been addressed to some extent in the literature (e.g., Gadde et al. 2003, Håkansson & Snehota 1995, Lundgren 1992), but the main assumption in the INA has been the existence of stable and durable relationships among actors (Easton 1992). Hence, it could be claimed that less focus has been given to the formation of “new” networks. As discussed above, market actors aim to form networks in evolving markets with a high level of uncertainty. Indeed, new networks are not formed in a vacuum but rather are formed as a result of the development of new technology (Lundgren 1995). Cravens et al. (1996) discuss the rationale for network formation and consider market characteristics to affect the design of (network) organization. For example, in a new market, an entrepreneur may establish networks to develop technologies and gain market access, whereas in mature markets, managers may rely on the internal network organization, resulting in a less extensive network. The role of entrepreneurs in establishing networks seems to be essential compared with that in established organizations. This may be related to the innovator’s dilemma raised by Christensen (1997), who emphasizes that the size of new markets rarely matches the size of larger, established companies but new actors may be needed.

Prior research on network formation has mainly focused on the dyad level; there is a lack of studies at the non-dyad level that focus on the formation of several relationships and inter-firm networks (Partanen & Möller 2012). As a driver of innovation, it is critical to “expand the ability to discover, to access and to interact with a potentially large number of diverse and specialized entities”,
that is, to organize a network process (Håkansson & Olsen 2012: 95). At the simplest level, a strategic network can be considered to emerge when an actor obtains an arrangement where it outsources its activities to the most efficient supplier, keeps the activity in which it has the greatest advantage, and lowers its transaction costs (Jarillo 1988). This view emphasizes the focal actor’s perspective.

Ozcan & Eisenhardt (2009) present three key strategies for entrepreneurial firms to originate alliance portfolios: advocating a unique industry architecture that proactively shapes the industry, taking long jumps that exploit opportunities to coordinate unconnected firms, and defending against emerging industry uncertainties. Partanen and Möller (2012) propose a framework for strategic network formation consisting of key stages. The process starts with a determination of the value-creation activities of the end customers. These activities influence the design of the offering and the necessary value activities in creating this offering. The second stage is the determination of the value-creating system, namely, identifying the ‘business concept’ underlying the targeted customer value creation and the offering and identifying the necessary value activities to realize the offering. The third step is the determination of objectives and the analysis of target activities. The company determines which value activities it wants to carry out internally and which to leave for other network actors. Based on this decision, the company can divide the process into two parallel sub-processes: analyzing the internal activities and analyzing the to-be-delegated activities. If the company does not have the resources and capabilities to match the targeted value activities, it needs to decide whether to develop and/or acquire the necessary resources or to delegate that activity to partners. This decision is also influenced by the number and quality of actors in the market. The final stages in the process, including the information gathering, negotiation, commitment, and execution stages with the potential partners, are iterative and overlapping.

Lundgren (1995) identifies three interrelated processes of the birth of a new network: 1) the emergence of a new technology, 2) the emergence of a new industrial network, and 3) the transformation of scientific discovery into industrial production. He emphasizes the roles of innovators and manufacturers as well as suppliers, users, distributors, and others joined together in networks of functions, activities, and actors. Möller and Svahn (2009) describe the emergence of a new business field similarly through three key phases. The exploration of future business is an early emergence phase that is characterized by competition
between actors and the determination of the potential of the applications offered by emerging technologies. In the mid-emergence phase, the mobilization for applications involves actors competing and collaborating in constructing dominant designs and applications. The coordination for the dissemination phase describes the shift from emergence to market competition and covers actors competing and collaborating in production and distribution networks to create markets. When proceeding along the phases, the network expands in transforming an idea into an innovation and turning the innovation into a viable business.

Heikkinen et al. (2007) identify different roles in the emergence of a new service development net based on three dimensions: the level of acting (task, net, and network levels), the perceived acting of others (expected or emerging), and the influence of acting in the net (incremental or radical). For example, the webber (expected net-level role) initiates net connections by deciding the potential actors for service development. The gatekeeper (emerging net-level role) can effect radical changes in the net because it possesses resources that are significant for the activities of the net. The producer (expected task-level role) contributes significantly to the service development work, whereas the entrant (emerging task-level role) interferes with the development process through its resources and connections to the larger network. The facilitator (network-level role) can offer venues or other resources for the net’s use, but it remains outside the development process. The formation of business nets includes critical decisions such as selecting members, agreeing on member roles and responsibilities (e.g., see above), and developing the operating principles among the actors (Partanen & Möller 2012). However, how can such decisions be made?

There has been discussion on network competence (e.g., Ritter & Gemünden 2003b) and capability (e.g., Walter et al. 2006) in the literature, describing the company’s abilities to develop and exploit inter-organizational relationships. Technology-oriented university spin-offs may not have the necessary capabilities to bring the new technology to market, and therefore, it is critical to make connections with market partners, such as suppliers, customers, research institutions, and legal authorities (Walter et al. 2006). The mobilization of resources and actors can be considered a prerequisite for the emergence of new networks, as it disturbs and disrupts coordinated activities and threatens the existing structures in the network (Lundgren 1992). Gulati et al. (2000) discuss lock-in and lock-out effects, which are situations in which ties formed with one actor place constraints on ties with others. Hence, when forming a net, actors may notice that by making choices to ally with certain actors, others may be excluded.
Flexibility may be limited unless there is superior bargaining power to use a portfolio of alliances (Gulati et al. 2000). This kind of power is related to the strategic network identity discussed by Anderson et al. (1994), where an actor’s attractiveness as an exchange partner is based on its connected relations among other actors, its links to their activities, and its ties with their resources. Thus, actor’s attractiveness as an exchange partner may be reflected by the actor’s position in the network as a mediator connecting important actors (Bonner et al. 2005).

Nyström (2009) emphasizes the increasing importance of business nets in the IT sector. The relationships being formed may be based on targeting a mutual goal, such as technology development or market creation. In addition, such relationships may be more short-term because they are created for a specific purpose. Technological innovation is a sequence of actions pursued in networks, and it determines the future structure of the network (Lundgren, 1995). Hence, the specific features of technology and technology-based services affect the structure of the net and the actors and their roles.

As observed from the above considerations, research on the formation of business nets is fragmented. To enhance this understanding, this study suggests that business models be used in the formation and evolution of the net. Next, the business model literature is reviewed to understand the potential of the business model concept to be used in such ways.

### 3.3 Essence of business models

Before discussing how business models may be used, we need to understand what business models are. In the following sections, the essence of business models as models is discussed, and the extant business model literature on defining and conceptualizing business models is then reviewed. Finally, the role of networks in business models is elaborated.

#### 3.3.1 Business models as models

Put simply, a business model is a model of a business. However, what is the essence of business models as models? Baden-Fuller and Morgan (2010) consider business models to have a multifaceted character: they enable us to classify businesses in taxonomy, and they may function as models in the scientific sense or as formulas for managers and scholars. The word ‘model’ often creates images
However, there is a flipside to this view. The notion of business model “refers in the first instance to a conceptual, rather than a financial, model of a business” (Teece 2010: 173). As Magretta (2002: 86) states, “a good business model begins with an insight into human motivations and ends in a rich stream of profits”. Hence, in addition to conceptualizing models merely as formulas, diagrams, or ‘structures’, it is important to consider what models can do. “Models are artificial worlds built to represent the real world” (Morgan 2005: 317). Morgan (2001) discusses the relation of models to the world. She considers ‘stories’ to be an essential part of how models are used. For a model to explain or describe the world, it needs a story to explain how it works and what it can do. In line with this concept, Magretta (2002: 87) considers a business model to be a ‘story’ explaining how a business works, with specific characters, plausible motivations, and a plot.

Therefore, the identity of the model is determined by not only its structure but also the questions that we can ask and the stories that we can tell with it (Morgan 2001). Hence, models have a dual character as stories (or narratives) and structures. Stories are tied to numbers, and a business model must pass the story test (the story must make sense) and the number test (the math must work) (Magretta 2002). Doganova and Eyquem-Renault (2009: 1567) discuss business models as boundary objects made of narratives and calculations that are complementary: “the narrative draws a world and justifies the selection of entities to be taken into account; the calculation detaches and associates these entities to create new ones, which are then stabilized and transformed into the characters of the story told”. Narratives and calculations are entangled in a model. Thus, models are not only structures but also stories, and through this combination, they can participate in producing knowledge (Morgan 2001). Araujo and Easton (2012) relate temporality to narratives and discuss the role of narratives in helping market actors face uncertainty and create spaces for action in a market. According to Araujo and Easton (2012: 315), “narratives are crucial vehicles for understanding how futures are deemed desirable and possible, and how different versions of the future are fought over and negotiated”. Simakova and Neyland (2008) also emphasize the role of narratives in constructing the future (market): the focus of analysis is the stories that organizations tell about themselves and the markets to different audiences that are required to make the future happen.

Narratives integrate the sequence of events and action (Czarniawska-Joerges 1995). Narratives can be “powerful mechanisms for translating ideas across the
organization so that they are comprehensible and appear legitimate to others” (Bartel & Garud 2009: 107), which is also the case in the business net and the market. Thus, narratives can be considered boundary objects that circulate among actors through social interaction, enabling actors to coordinate their present and future with their past (Bartel & Garud 2009).

This study argues that business models can help raise questions not only of the present but also of the possible solutions, with the potential to create stories to motivate others. The structure of the model itself constrains and shapes the questions and stories: we can only present questions of the relations and terms represented in the structure (Morgan 2001). If the model cannot answer certain questions, it must be changed. Thus, models are also flexible mediators between theory and the world (Morgan, 2005). In line with this view, this study argues that business models are mediators between theory and practice and between scholars and practitioners. Therefore, business models shape and are shaped by the theory of the business and the business practice. Business models can be considered to have both material forms and more social forms, as the representations or artifacts of the business model circulate among different actors (see e.g., Doganova & Eyquem-Renault 2009).

Models are used by not only scholars trying to represent the world but also managers in their everyday work. Czarniawska and Mouritsen (2009) argue that managers tend to avoid technological products and material objects because they are too concrete and inhibit management; rather, managers prefer things to be moldable. These authors refer to ‘management quasi-objects’ as helping translate things and people into ‘manageable objects’ and thus “allowing them to operate on the material world from a distance” (Czarniawska & Mouritsen 2009: 164, 169). Hence, business models can also be considered a mediator for managers to turn original objects, such as technology, into manageable objects and thus to develop the possible context for the technology in its potential form—to shape the market for the technology.

The word ‘model’ has baggage to many, being loaded with preconceptions of models as mere structures or mathematical formulas or calculations. However, as noted the above, business models have a twofold character as models. Business models are mediators between theory and practice in that they are analytical devices for scholars to understand real-life phenomena in practice and for practitioners (managers) to plan and take action. As devices, business models combine a structure with a narrative. In the following section, the extant business model literature is reviewed to understand the business model concept itself.
3.3.2 Evolution in the conceptualization of business models

The extant business model literature comprises a wide range of fields and is fragmented. The concept draws from and integrates a range of disciplines (Chesbrough & Rosenbloom 2002, Shafer et al. 2005), and the role of business models in firms is often debated (Osterwalder et al. 2010). The business model literature has evolved since its very early emergence in the academic literature (Bellman et al. 1957, Jones 1960), and it saw explosive growth during the dotcom boom. Some clear evolution paths can be identified by considering the developments in the past few decades.

Much of the literature has focused on defining the business model concept and identifying different types of building blocks, components, or elements of business models. Doganova and Eyquem-Renault (2009) call this as an essentialist view of business models that provides simplified descriptions of companies. Such definitions share a common view of the business model concept, namely, a description or representation of reality beyond the firm. Following this stream of literature, many scholars have reviewed business model definitions, presenting classifications of business model elements while attempting to make sense of the wide range of literature (see e.g., Hedman & Kalling 2003, Morris et al. 2005, Nenonen & Storbacka 2010, Osterwalder et al. 2005, Shafer et al. 2005). Morris et al. (2005) identify three levels of business model definitions: economic, operational, and strategic. At the most basic level, a business model is considered to be the firm’s economic model, which describes the logic of profit generation. At the operational level, a business model describes the architecture of internal processes and the infrastructure design that enable the firm to create value. At the strategic level, business model definitions emphasize the overall direction in the firm’s market positioning, interactions, and growth possibilities.

A business model can be simply regarded as “the architecture of the revenue” (Chesbrough & Rosenbloom 2002: 530), but most definitions consider business models even more broadly as the value creation logic or architecture of the company. The functions of a business model are to articulate the value proposition, identify the market segment, define the structure of the value chain, estimate the cost structure and profit potential, describe the position of the firm within the value network, and formulate the competitive strategy (Chesbrough & Rosenbloom, 2002). Many definitions of business models stem from e-business research. An example is Timmers’ (1998) definition of the business model, which is divided into three interrelated parts: 1) an architecture for product, service, and
information flows, including the various business actors and their roles; 2) a description of the potential benefits for business actors; and 3) a description of the sources of revenue. Weill & Vitale (2001) note that business models articulate the roles and relations among the firm’s customers, allies, and suppliers and identify the major flows of product, information, and money as well as the major benefits for the actors. Furthermore, a business model can be considered an important locus of innovation and a crucial source of value creation for the firm and its suppliers, partners, and customers (Amit & Zott 2001). Afuah and Tucci (2001) note that business models provide an organization’s core logic for creating value, representing the system of components, linkages, and associated dynamics to produce value.

After the crash of the dotcom boom, the business model concept suffered from suspicion regarding its relevance. In the last decade, the literature has provided broader definitions of the concept that are not tied to e-business. Osterwalder et al. (2005: 4) describe a business model’s place in the company as “a blueprint of how a company does business”, translating strategic issues into “a conceptual model that explicitly states how the business functions”. They emphasize the internal issues of the company, such as the role of the business model in the company. Taking into account the external environment, Shafer et al. (2005: 202) define a business model “as a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network”. According to Teece (2010), a business model “articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers”.

Such broader definitions have been divided into smaller components and elements. One of the most used and accepted classifications of business model elements is that of Osterwalder et al. (2010), who proposed the business model canvas, which has nine building blocks: value proposition, partners, activities, resources, customer relationships, channels, customer segments, cost structure, and revenue streams. Based on the existing literature on business models, Shafer et al. (2005) identify four major categories of business model components: strategic choices, value creation, value capture, and the value network. Hedman and Kalling (2003) propose the following causally related components of a business model: 1) customers, 2) competitors, 3) offerings, 4) activities and organization, 5) resources, 6) supply of factor and production inputs, and 7) a longitudinal process component to cover both the dynamics of the business model and the cognitive and cultural constraints that management has to take into

In addition to the various definitions and classifications of the elements of business models, previous research has provided examples of different types of business models. Such examples are especially prominent in e-business research. Hedman and Kalling (2003) divide e-business model research into two complimentary streams: the first stream focuses on describing and defining the key components of an e-business model (see above), and the second stream develops descriptions of specific e-business models (e.g., Timmers 1998, Weill & Vitale 2001). Osterwalder et al. (2005) also recognize a stream of literature on describing types of business models (taxonomies) and another stream on providing real-world examples of business models. They further argue that the most recent stream of literature concerns applying the business model concept, e.g., by increasing readiness for the future.

Indeed, the business model literature has more recently evolved from static descriptions and taxonomies toward a more dynamic approach. Questions concerning business models have shifted from asking ‘what are business models?’ to asking questions such as ‘what do business models do?’ (Doganova & Eyquem-Renault 2009), ‘who uses them, for what, and how?’ (Baden-Fuller & Morgan 2010), and ‘how are business models created and practiced?’ (Mason & Spring 2011). Focus has shifted toward business model development and innovation (see e.g., Chesbrough 2010, Teece 2010), which is discussed further in chapter 3.4.2. Scholars have addressed the dynamic nature of business models as devices to explore the market (Doganova & Eyquem-Renault 2009), to shape and coordinate action (Mason & Spring 2011), and to address change and focus on innovation (Demil & Lecocq 2010). Business models are considered to be prospective, demonstrating a future venture and that venture’s value creation logic, feasibility, and worth to the needed partners. Hence, business models are demonstrations that “aim at providing evidence for the feasibility of an innovative project and at gaining the interest of third parties by mobilizing the repertoires of both proof and persuasion, and the logic and rhetoric elements that they include” (Doganova & Eyquem-Renault 2009: 1568). Following this line of argument, the conceptualization of business models focuses more on what business models can do instead of what they can describe. Business models can be conceptualized as narratives (Magretta, 2002), schemas (Clarke & Freytag, 2011), mental models
(Storbacka & Nenonen, 2011), and collective cognitive representations (Doz & Kosonen 2010).

The classification of the essence of business models based on the extant business model literature is described in Figure 4. Following the identity of models determined by the questions that we can ask with them and the stories that we can tell (Morgan 2001), and drawing on the evolution of the business model concept itself, there are a variety of questions that we can ask with a business model concerning business activities. However, in the existing business model literature, the essence of business models as analytical devices has not been addressed. In this study, a business model is conceptualized as a device in contexts of uncertainty (Doganova & Eyquem-Renault, 2009), such as technology-based service markets, and in nets of market actors to coordinate and mobilize action (Mason & Spring 2011). In the following section, the ways in which the business model literature has addressed networks are examined in greater detail.
3.3.3 Networks in business models

Most of the definitions of business models found in the extant literature adopt an internal view of the company, focusing on intra-organizational factors or elements. Traditional business models are based on the idea of developing, producing, marketing, and selling a product by oneself (Chesbrough and Schwartz, 2007), and hence, business models are considered to be centered on a particular actor (Amit & Zott 2001). Some conceptualizations of business models are more externally oriented (Nenonen & Storbacka 2010) and acknowledge the surrounding business environment or network of the company: networks are identified as a key element of business models (e.g., Shafer et al. 2005, Tikkanen et al. 2005, Westerlund et al. 2008). Various definitions of business models emphasize the different actors involved (e.g., Amit & Zott 2001, Timmers 1998, Weill & Vitale 2001). The role or the position of a company in a network has also been addressed (e.g., Chesbrough & Rosenbloom 2002, Shafer et al. 2005, Westerlund et al. 2008).

Still, much of the extant business model literature provides a description of the firm at a single point in time and fails to consider the influence of the business network on a firm’s business model, and vice versa. Thus, the literature fails to show the power of business models to bring about change in the network (Mason & Spring 2011). Zott and Amit (2010) characterize business models as a system of interdependent activities performed by the focal actor as well as those performed outside the boundaries of the actor, including, e.g., its partners, vendors, and customers. Still, such activities are claimed to remain firm centric, enabling the actor to create value with its partners and to appropriate a share of the value itself. A business model can provide an even broader conceptualization (Nenonen & Storbacka 2010, Zott & Amit 2008) for capturing the evolution of value creation from individual firms to networks (Nenonen & Storbacka 2010). As the network perspective emphasizing the various actors and their relationships has been discussed in earlier sections, the level of business model use now shifts from individual actors to a network or a net of actors. Cooperating with partners in the R&D of a new product or service creates business model options with many benefits, such as opening new markets (Chesbrough & Schwartz 2007).

At one extreme, a business model may describe the way the whole “network of companies aims to create customer and network value” (Kijl et al. 2005: 2). Chesbrough (2007) discusses ‘open business models’ that enable companies to create more value by leveraging more ideas, which can also be external to the
organization, and allowing greater value creation by utilizing a company’s key resource or position, not only internally but also in other companies’ businesses. Storbacka and Nenonen (2011b) suggest that a business model is the interface through which the interactions between the actors in the network are conducted. Business models can explain the formation of market configurations (networked market) depending on “which actors have compatible enough business models to enter common market practices and how the changes in one actor’s business model transfer through market practices to other actors’ business models” (Nenonen & Storbacka 2010: 53). Hence, business models need to be attractive to the actors (Bouwman et al. 2008) engaging in the net of developing and commercializing a technology-based service. Chesbrough and Schwartz (2007) discuss business model alignment, where a fundamental task in developing co-development relationships is to determine the extent to which an actor’s business model is aligned with those of other actors. Business models can also be considered tools for forming the network for a new innovation or venture (Doganova & Eyquem-Renault 2009). By applying a network perspective, business models are suggested to be networked because they are interlinked with the business models of others and can be shared in a net of actors to create a common understanding of what needs to be done. Thus, a business model is a device for market actors in the net. The activities that involve business models are elaborated in the following section.

3.4 Activities of business models

As discussed in section 3.3.2 on the evolution of the business model literature, more recent developments emphasize the dynamic approach to business models. This study examines the activities of business models, which are considered to be dynamic. These activities are elaborated next.

3.4.1 Exploiting business opportunities through business models

One of the functions of a business model is to exploit business opportunities (Zott & Amit 2010). Research on opportunity recognition is based on the entrepreneurship literature (Park 2005). In fact, Shane and Venkataraman (2000) state that the field of entrepreneurship is concerned with the sources of opportunities; the processes of discovery, evaluation, and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them.
Entrepreneurial orientation has been emphasized for the success of university spin-offs (Walter et al. 2006) and setting up ventures to commercialize new technological innovations.

Singh (2001) defines entrepreneurial opportunity as a feasible, profit-seeking, potential venture that offers an innovative new product or service to the market, improves an existing product/service, or imitates a profitable product/service in a less-than-saturated market. Park (2005) identifies three components of the opportunity recognition process: the founding entrepreneur, the collective knowledge and experience of the firm, and the technology on which the new venture is based. In the opportunity identification and development process, entrepreneurs develop new ideas by combining and recombining existing ideas in new ways (Chandra et al. 2012). Ideas on the product, service, or market can be translated by a business model into viable opportunities. Entrepreneurial learning (Corbett 2007) is important for entrepreneurs’ ability to expand their ideas and develop better opportunities (Chandra et al. 2012).

The creation of new businesses starts with an opportunity development process (Ardichvili et al. 2003). Entrepreneurs must discover opportunities to translate technological developments into new processes, products, and markets (Shane 2000). Hence, to create business from a new technology, either the inventor or the entrepreneur must recognize the opportunity and evaluate it (Ardichvili et al. 2003) and exploit it in a business model.

Much of the entrepreneurial opportunity discussion focuses on the individual. The characteristics of individuals, such as entrepreneurial alertness to the market (Ardichvili et al. 2003, Eckhardt & Shane 2003) and the knowledge possessed by the entrepreneur (Shane 2000) are asserted to be key to the discovery of opportunities. Departing from this conceptualization, Garud and Karnøe (2003) define technology entrepreneurship as a larger process that builds upon the efforts of various actors from different domains, such as production, evaluation, and regulation. A focus on the opportunity instead of the firm or the entrepreneur directs the view toward multiple actors, resources, and processes (Styles & Gray 2006). Taking an idea from its inception to commercial exploitation demands the mobilization of resources from different market actors (Garud & Karnøe 2003, Karnøe 1996) in the business net. Thus, in parallel with individuals, the role of organizations can be substantial in providing leverage for entrepreneurial activities (Ehret & Wirtz 2010).

Gartner (1989) emphasizes entrepreneurial actions and behavior as the phenomena behind the set of characteristics and capabilities of an entrepreneur.
Thus, an entrepreneurial person is not distinguishable from others because the person would be different from a non-entrepreneur but because he or she performs opportunity-related actions (Alvarez & Barney 2007). More precisely, the entrepreneurial actors can even act ‘as if’ an emerging business is an existing business that aims to convince the net around them (Gartner et al. 1992) to shape a market for an emerging technology-based service. Thus, these actors are able to recombine the already existing ideas and/or resources in a creative way. This dynamic is especially crucial when developing a business model for technology-based services, where business potential and commercialization remain to be planned and realized.

This study accepts that the identification, creation, and exploitation of opportunities are actions that are dispersed around a net of actors. There is a need for entrepreneurial activities in the business net to create opportunities in the market and thus shape the market for emerging technology-based services.

### 3.4.2 Developing business models

Business models have been blamed for failures in commercializing technological innovations. Instead of focusing on describing the right types of business models, research has explained such failures with a more recent focus on developing and innovating business models (e.g., Chesbrough 2010, Teece 2010).

Companies often invest extensive resources and processes to develop new technology and technological innovations, while they have shown a rather limited ability to innovate business models to commercialize the new ideas (Chesbrough 2010). Technological innovations trigger business model development due to the need to bring new discoveries to market and the chance to satisfy novel customer needs (Teece 2010). It could be argued that companies need to develop capabilities for business model development (Chesbrough 2010). In addition, companies need the capacity to manage and implement business models to transform business models into more concrete elements, such as a business structure and business processes (Osterwalder et al. 2005), and, ultimately, into business activities (Doganova & Eyquem-Renault 2009).

In developing business models for evolving technology, it is important to understand that “it takes more than technology to profit from technology” (Afuah & Tucci 2001: 70). Creativity and insight, as well as customer, competitor, and supplier information and intelligence, are needed in developing new business models (Teece 2010). Companies need to adopt an effectual attitude toward
business model experimentation, identify internal leaders for business model change, and adjust the culture to embrace new models (Chesbrough 2010). Key decisions in developing business models concern their core elements: the selection of technologies to be embedded in a product/service, determining the benefit of the product/service to the customer, identifying market segments, confirming available revenue streams, and designing mechanisms to capture value (Teece 2010). However, it should be noted, such decisions may not be as straightforward (e.g., identifying market segments) and are not made in a ‘vacuum’. Instead, such decisions are made in interaction with the market actors, especially when there are no existing markets or customer demands.

Only a few studies have focused on specific phases in developing a business model (see e.g., Afuah & Tucci 2001, Kijl et al. 2005, Morris et al. 2005). During the initial phases, a business model is fairly informal and implicit: a process of trial and error follows, and a number of decisions are made to delimit the directions (Morris et al. 2005). The development of a business model can start from an “overflowing” situation, with multiple possible but uncertain applications of the technology, requiring the actors choose a path to follow and limit the possibilities (Doganova & Eyquem-Renault 2009). The actors to be involved are first defined, and potential partners are then identified. Actors such as research institutes, entrepreneurs, and venture capitalists may play an important role in the early phases (Kijl et al. 2005). The business objectives for all collaborating should be clearly defined (Chesbrough & Schwartz 2007). When a fairly definite and formal model has been developed, adjustments and ongoing experiments follow (Morris et al. 2005). Doganova and Eyquem-Renault (2009) view this development as a series of experiments in market creation. These experiments consist of encounters with potential partners who transform the net being built by the entrepreneur’s innovation. Chesbrough (2010: 359) also discusses business model experimentation: “undertaking active tests to probe nascent markets with new potential configurations of the elements of a business model can allow a firm to learn ahead of the rest of the market”. From such ‘innovation spaces’, new understandings and possibilities can be realized (Stark 2009) in new business models.

Although there are clear needs and benefits for developing business models, challenges also exist. At the outset, new business models often seem unattractive to internal and external stakeholders (Johnson et al. 2008). The success of established business models influences the information routed into or filtered out of the corporate decision process; this presents a cognitive barrier to business
model experimentation and leads firms to miss potentially valuable uses of new technology that do not fit into their current business models (Chesbrough 2010). Regarding this point, it could be argued that business models have power to act as barriers for new innovations and limit the opportunities that actors identify.

As discussed above, most studies on business model development consider business models to be an end result of the development process and do not sufficiently consider the role of the model itself in developing the emerging business. Business model development is a continuous process that cannot be considered completed at any time. Indeed, timing is important in developing business models. An appropriate business model in the early emergence of a technology may not succeed when the technology is mature (Afuah & Tucci 2001). Thus, business models are not fixed entities, once they have been developed, but change and evolve continuously. Some scholars discuss business model renewal (see e.g., Doz & Kosonen 2010) to address the changes in the competitive environment on a continuous basis. However, in addition to business models being continuously changed, business models are used to bring about change. Therefore, we need to examine the ways in which business models can frame action.

3.4.3 Business models as frames for action

This study suggests that business models have agency to shape the actions within the organization as well as the actions of others outside it (see Kjellberg et al. 2012). The power of a business model is dependent on the actor’s network position, the strength of the actor’s business model, and the ability to present compelling interpretations of the meaning of markets (Storbacka & Nenonen 2011b). Following this point, this study focuses on how market actors can use business models to frame action in the surrounding business environment, the business net, and the market.

To understand the ways in which business models can be used, this study draws on framing theory. The framing perspective can help elucidate how companies frame their business models and how these frames prevent or advance their actions in a networked market. The concept of frames has gained considerable recognition in sociology (Benford & Snow 2000). According to Oliver and Johnston (2000), frame theory is based on linguistic studies of interaction, referring to ways that shared assumptions and meanings are represented and shape the interpretation of events or actions. Framing has also
been strongly connected to literature on social movements (Benford & Snow 2000, Snow et al. 1986), explaining how groups reach consensus and are mobilized to take action.

In the social movement literature, meaning construction has been conceptualized as ‘framing’ action or practice of creating frames (Benford & Snow 2000). Frames can be used to affect the interpretations of events among different actors (Fiss & Zajac 2006). Oliver and Johnston (2000) characterize frames as individual cognitive structures that guide the interpretation of individual experience. They are also shared by individuals to channel individual behaviors into patterned social behaviors. Collective action frames can be understood as “action-oriented sets of beliefs and meanings” (Benford & Snow 2000: 614).

Beunza and Garud (2007: 26) define a calculative frame as an “internally consistent network of associations, including (among others) categories, metrics and analogies”, which helps in the valuation of an organization. These authors consider such frames not to be merely abstract entities but to take the form of material, tangible elements (e.g., text, spreadsheets, diagrams). By understanding business models as frames for action, business models can be used to provide a collective understanding and to mobilize action among different actors. Through framing, business models become ‘shared knowledge’ (see Reckwitz 2002).

Drawing on the above, framing is a process in which the meaning of a specific situation or an event is constructed among a net of actors. A business model or its elements can be framed differently, for different purposes, and for different actors. Callon (1998: 250) illustrates framing nicely: “to negotiate a contract or perform a commercial transaction effectively presupposes a framing of the action without which it would be impossible to reach an agreement, in the same way that in order to play a game of chess, two players must agree to submit to the rules and sit down at a chessboard which physically circumscribes the world within which the action will take place”. A business model is used to create a consensus and stabilize a space for action, for example, to shape a market. Hence, individual actors can act only collectively through their interactions with others with multiple frames (Garud 2008).

However, how are such frames developed or generated? According to Fiss and Hirsch (2005), the process of the social construction and negotiation of meaning has been primarily addressed in two related but distinct streams of literature: sense making and framing. These authors argue that sense making emphasizes the internal, self-conscious process of developing a coherent account of what is going on, while framing stresses the external, strategic process of
creating specific meaning in line with political interests. Benford and Snow (2000: 614) consider framing to be an active process “that implies agency and contention at the level of reality construction”. Framing is active, as something is being performed, and processual as a dynamic, evolving process. Framing entails agency in the sense that what is evolving is the work of different actors, and it is contentious in the sense that it involves the generation of interpretive frames that may not only differ from existing ones but also challenge them. Fiss and Hirsch (2005: 30) suggest that framing involves “the processes by which actors influence the interpretations of reality among various audiences”. This assertion implies that there can be differing and competing frames (by different actors). Beunza and Garud (2007) use the concept of framing controversies to refer to divergences among frames. Frames can be adopted by actors but also abandoned in the absence of convincing evidence. The selection of a frame is shaped by the success of collective action efforts and the support of powerful actors (Rao 1998: 920), whereas the abandonment of a frame is influenced by concrete information interpreted based on the social context (Beunza & Garud 2007). Business model frames compete with those of other market actors. Therefore, it is important to understand how those frames can be aligned and which frames dominate and prevail in frame contests.

Benford and Snow (2000) distinguish three processes of frame development: 1) discursive, 2) strategic, and 3) contested. Discursive processes refer to talk, namely, the verbal and written communications among actors. Strategic processes can be characterized as deliberative, utilitarian, and goal directed. Here, frames are developed and deployed to achieve a specific purpose. Contested processes refer to a situation where actors are unable to construct and impose upon their intended audiences any version of the reality that they want, but there are a variety of challenges confronting those who engage in framing activities. By examining how business models are articulated, to what purpose, and with whom, we stand to generate insights into the way in which business models are put to work as frames for action and which frames may end up dominating others.

Going further, Snow and Benford (1988) distinguish between three types of framing tasks: diagnostic, prognostic, and motivational framing. Diagnostic framing refers to problem identification (a diagnosis of some event or aspect of social life as problematic). Prognostic framing includes the articulation of a proposed solution to the problem and the strategies for carrying out the plan (what needs to be done). Motivational framing provides the rationale for engaging in collective action (prods to action). Diagnostic and prognostic framing aim to
achieve consensus mobilization, that is, agreement about the causes and solutions to a specific problem. Motivational framing, on the other hand, concerns action mobilization, namely, the rationale for action. Following this, a business model may be used as an analytical tool for diagnosing problems, as a prognostic tool for creating a solution to that problem, and even as a rationale for mobilizing collective action.

Business models as frames for action may shape and mobilize actions of other market actors by creating a collective or shared understanding between the actors and thus creating a consensus of what the market is and what should be done. When frames are contested, new frames are created. The process of framing consists of activities that frame problems or opportunities, solutions, and actions. However, as noted above, framing is never complete. According to Callon (1998: 17), the framing process is impossible to conclude because there are always relations (externalities) that defy framing. He uses the term overflowing to refer to this impossibility of total framing; a single frame always leaves something ‘out’ (externalities) and ‘overflows’. For example, a business model includes only certain types of technologies, actors, and service offerings. Any frame is subject to overflowing, and the frame is then reframed to include the externalities. If the technology changes, a firm’s business model needs to be reframed to include the changing technology and its influence on the necessary actors and service offerings. This dynamic is related to Arthur’s (2009) notion of the continuous evolution of the economy as its technologies evolve. The economy is never stable; rather, there is a constant remaking of the arrangements that form the economy. Novel technologies cause new problems, creating new opportunities that call for the introduction of new combinations of technologies—and further problems.

Market actors can question a business model’s elements and consider possible solutions; at the same time, they are already framing the possible business model within the existing market. At best, a business model can be used as a frame for action to motivate the actors to transform an emerging market (with the specific business model elements) into an existing market.

### 3.5 Summary: Use of business models

This chapter provides a summary of the previously discussed theoretical background and presents a theoretical framework for the use of business models; this framework is depicted in Figure 5.
The emerging technology-based services provide a contextual premise for this research. Technological development presents various challenges as well as opportunities for actors embedded in today’s society, economy, and markets. Indeed, the traditional ways of ‘managing’ markets may no longer work; instead, new types of ‘market management’ or ‘marketing’ activities are needed in developing and commercializing technological innovations. Instead of identifying market segments for new technology-based services, as has been suggested in traditional marketing literature as well as in the business model literature, the key may be to construct the market (e.g., Harrison & Kjellberg 2010). Hence, the technology-based service market as conceptualized in this study is ‘in the making’ (Kjellberg et al. 2012), and the market actors need to perform activities that construct the market. Business models are suggested to act as devices in constructing markets.

Technology-based service markets are socially constructed by various market actors engaging in market activities (Storbacka & Nenonen 2011b). Such actors form smaller business nets (Möller & Rajala 2007) consisting of actors who develop, produce, and market specific emerging technology-based services. The net evolves from the development or application phase into a viable business net. The net is considered strategic, with common objectives and intentions, and may involve different types of market actors (e.g., companies, investors, regulators, and research institutions). Hence, markets consist of smaller nets of actors.

Because the actors only have vague ideas of the future market, devices are needed to plan business for a novel technology. Business models are suggested to be used by market actors in the market and the business net (Chesbrough 2007, Doganova & Eyquem-Renault 2009, Mason & Spring 2011).
Fig. 5. Theoretical framework of the use of business models.

Based on theoretical understanding, business models are not only static descriptions but also dynamic and hence can be altered to change the actions of market actors. Business models are disassembled into different elements (structure), which can be reassembled in different ways. Such elements are interrelated and influence each other. Because the elements are interwoven, business models are also narratives telling a story about how the elements fit together. Although business models are traditionally conceptualized to be focused on a single firm, they can also be networked, interlinked and shared by multiple actors. Business models exploit opportunities and are developed and frame action at multiple levels: the organizational level, the business net level and the market level.
4 Methodology

In the preceding chapters, the chosen theoretical premises were discussed. This chapter introduces the methodological choices of this study, including the data collection and analysis methods. The data collection took place for both empirical settings of the study: the UBI service pilot and the IT service development projects. As noted in the introduction, this study is qualitative and employs an integrative, multi-method approach in studying the phenomenon. Research cannot be “method bound” (Gilmore & Coviello 1999: 52), but the best possible methodology needs to be developed for the specific purpose of the study (Gilmore & Carson 1996), to understand the use of business models. Here, the methodological choices that were made to answer the research problem of the study are discussed, starting with the philosophical positioning of the study.

4.1 Research philosophy

The philosophical position of the study guides the overall research design. Guba and Lincoln (1994: 105) refer to this as a research paradigm that represents “the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways”. Hence, the research paradigm refers to the assumptions about the world and the nature of knowledge (Collis & Hussey 2003: 46). Paradigms represent what we think about the world, and hence, our actions in the world cannot occur without reference to paradigms (Lincoln & Guba 1985). Every researcher employs assumptions about the nature of the social world, either implicitly or explicitly (Burrell & Morgan 1979). The values and goals of the researcher, that is, the axiology, influence not only the philosophical assumptions but also the methodological choices of the study (Easton 1995). Therefore, it is important to discuss the research philosophy of the study.

Qualitative research approaches are related to several philosophical traditions in differing ways (Eriksson & Kovalainen 2008). Hence, determining the underlying philosophical assumptions related to a complex phenomenon is not straightforward, as in this study. In addition, there are varying views and concepts used in the literature that refer to the different paradigms in social sciences. One of the most common distinctions has been made among positivism, postpositivism, critical realism, and constructivism (Guba & Lincoln 1994), employing different ontological, epistemological, and methodological choices
(although these are overlapping to some extent). Following this classification, the research paradigm of this study is presented next, with a discussion on the ontological and epistemological assumptions.

As this study considers the phenomenon under focus—the use of business models—to be dynamic and multifaceted, static positivist assumptions are unsuitable for the study (see Ryan et al. 2012). Hence, a more social nature of the world is emphasized, allowing for actors’ continuous and dynamic construction of reality to be considered. Researchers in social theory should be concerned with “reworking conceptions of human being and human doing, social reproduction and social transformation” and understanding ‘the nature of human action and the acting itself’ (Giddens 1984: xx, xvii). These aspects of action and acting constituting the phenomenon are of interest in this study.

To understand social systems consisting of individuals, social practices, and processes, as well as social structures (Peters et al. 2013), two different research paradigms have been put forward, not only in marketing but also in organizational studies and strategic management: critical realism and constructionism (Holt & Mueller 2011, Järvensivu & Tönnroos 2010, Mir & Watson 2001, Peters et al. 2013). Despite their differences, these paradigms overlap to some extent. This study considers both paradigms in the sense that social reality is perceived to be socially constructed (see Peters et al. 2013) and that through local truths we can better understand reality (see Järvensivu & Törnroos 2010). The social reality is considered “an on-going process of creation” (Kjellberg & Helgesson 2006: 840), but the reality itself is not merely socially constructed. The reality (e.g., market actors and their nets) can be distinguished from the empirical events that we are able to capture (Easton 2010), and hence, our knowledge of the relationships between the actors is not the same as what occurs ‘out there’ (Ryan et al. 2012). However, the phenomenon under study (the use of business models) is understood through the concepts that the researcher employs and the various meanings that the actors give them. A business model does not exist independently of actors and observers. There are varying perspectives on the essence of business models, which all contribute to our knowledge of the use of business models. In this way, this study is concordant with what Järvensivu and Törnroos (2010) call moderate or critical constructivism. According to moderate constructionism, the researcher believes that there are multiple viewpoints of knowledge with “multiple constructed, community-bounded realities” (Järvensivu & Törnroos 2010: 100). There is no single, true reality of the business model concept but rather multiple perspectives or local truths. If one expects one,
true reality of the business model concept to exist, the use of business models would be limited to a certain type of situation or context. However, this study argues that the usefulness of business models lies in their use across different situations and for different purposes. It is important to choose one specific perspective at a time and observe the reality through that perspective (Järvensivu & Törnroos 2010), as has been done in the original research papers. These multiple perspectives can create new and usable knowledge of the subject of the study, namely, business models.

Ontology refers to the nature of reality, or the way that we see the world (Eriksson & Kovalainen 2008). Based on moderate constructivism, this study applies a relativist ontological position referring to subjective realities instead of assuming an objective reality (Järvensivu & Törnroos 2010). How actors see a business model (or its elements) influences their actions in the market. Therefore, it is important to understand not only what kind of understanding an actor holds of a business model but also how and to what extent a specific set of actors can create a shared understanding of the business model to enable them to take action in the business net and shape the market. Such a shared understanding may differ from the perceptions of single actors but is needed for the actors to engage in collective action.

Epistemology defines the nature of the relationship between the researcher and what can be known (Guba & Lincoln 1994), that is, the “ways of knowing about the world” (Easton 1995: 420). This study takes a subjectivist epistemological position (Denzin & Lincoln 2000), by focusing on the different ways in which reality is constructed as a topic for empirical inquiry (Kjellberg & Helgesson 2007). Knowledge is available through social actors (Eriksson & Kovalainen 2008) and their activities. Instead of describing a specific aspect of business models, this study focuses on how business models are perceived and constructed by different actors, both individually and collectively.

4.2 Abductive research process

The researcher believes theory and practice are interlinked: the theories that we hold shape our activities and the actual phenomena, and vice versa. Hence, the study follows an abductive research approach (Dubois & Gadde 2002), which is often used in both critical realism and constructionism (Järvensivu & Törnroos 2010). Dubois and Gadde (2002: 554) use the concept of systematic combining to
refer to the “continuous movement between an empirical world and a model world”. The abductive research process of the study is presented in Figure 6.

**THEORETICAL PREMISE**

- Defining business models
- Network approach and strategic networks
- Refinement of BM elements
- BM development
- Business net formation
- Business opportunities
- Use and dynamics of business models
- Framing
- Market studies

**EMPIRICAL PREMISE**

- Contextual pre-understanding
- Delphi 1
- Expert interviews
- 1st round interviews
- 2nd round interviews
- Delphi 2 and 3

**Stage 1** (paper I)
- Stage 2 (paper II)
- Stage 3
- Stage 4 (paper III)
- Stage 5 (intro chapters)

**Refinement of a framework for the use of business models in marketing**

**Fig. 6. The abductive research strategy of the study.**

The role of theory in this study is to provide a preliminary understanding of the phenomenon and its complexities for the researcher to be able to narrow the focus of the study. It is also used throughout the research process to understand the phenomenon conceptually. Empirical data have been collected from the start at different stages of the research process, and thus the theoretical perspectives on the phenomenon have been updated. The empirical elaborations on the research phenomenon have developed the understanding of researcher, and as a result, additional theoretical perspectives, such as business opportunities and framing, have been incorporated into the research. In the end (stage 5), the theoretical and empirical understanding gained throughout the research process combined with
the original research papers yields the final results on the use of business models. These results are presented in Chapters 5 and 6.

The business model concept is grounded in many disciplines. As noted, it has been argued that there is no intellectual home or solid theoretical basis for the business model concept (see e.g., Teece 2010). In addition, the business model concept is approached here as processual and dynamic instead of as static in structure. To understand the processes behind decisions and actions (i.e., the use of business models), this study employs a research approach that allows a holistic and longitudinal examination of the phenomenon (see Gilmore & Coviello 1999). To do this, multiple theoretical perspectives and research methods are employed, as in the three individual papers included in the thesis. Although all these papers employ a qualitative research approach, each paper has a specific aim and research process. Therefore, the underlying research paradigms in the papers may differ to some extent. Indeed, some degree of metatriangulation (Lewis & Grimes 1999) takes place because the studies employ various theoretical perspectives, research paradigms, and research methods.

**Fig. 7. The research process.**

Figure 7 presents the research process in time. The process began with a literature review and preliminary empirical data collection to gain a pre-understanding of
the phenomenon. To obtain a diverse and rich understanding of the phenomenon, different types of empirical settings were examined: the UBI service pilot, in which new technology-based services were developed and tested with real end-users, and the IT service development in four individual companies. The process consists of five key stages where both theoretical and empirical data are in a continuous dialog. The first four stages compose the phases of the empirical research, whereas the final stage focuses on the results gained throughout the whole research process.

4.3 Multi-method approach

A key methodological difficulty in this study lies in its research context: the challenge of researching business models in an emerging technology-based service market, which may not exist yet, with future technology-based services that are still in a development phase. However, this study aims to understand the use of business models instead of business models per se, and thus, the research context provides a unique possibility to follow the use of business models in business nets that are aiming to connect emerging technology-based services with a future market.

The business model concept needs to be examined from multiple theoretical and empirical perspectives to understand the ways in which business models can be used by market actors. Hence, this study employs an ‘integrative’ multi-method approach that enables a holistic and longitudinal examination of the phenomenon (see Gilmore & Coviello 1999). The different methods employed in the study provide flexibility in examining different aspects of the phenomenon in its context. Hence, the data were gathered using a variety of methods, which are summarized in Table 2 (see also Chapter 4.5).

<table>
<thead>
<tr>
<th>Table 2. Summary of the multi-method approach of the study.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>Purpose of using the methods</td>
</tr>
</tbody>
</table>

| Purpose of using the methods | To follow market actors’ activities and gain their expectations in | To follow market actors’ activities and gain their experiences and expectations in their specific IT service |
There are many advantages of using a combination of research methods to understand how scholars and practitioners perceive and perform marketing within the context of conducting business (see Gilmore & Coviello 1999). First, the combination of research methods allows a more in-depth understanding of complex and vague processes, such as the use of business models, taking into account the development and changes in the market and the dynamic dimensions
of the business model concept over a longitudinal time period (see Gilmore & Coviello 1999). Hence, a key dimension of the research strategy employed in this study is temporality, and the research approach is therefore longitudinal (see Chapter 4.4). A longitudinal research approach allows for the understanding of the researcher to develop throughout the research process. In this way, each stage in the research process builds on what has been learned in the previous stage (Gilmore & Carson 1996). The researcher has been involved in the two projects in which the data have been collected over four years, and the data collection and analysis were conducted at different stages of the process, building on the theoretical and empirical understanding gained through the previous stages. This approach is also concordant with the abductive research approach.

Second, the combination of methods enables the research to be carried out in dynamic business environments (Gilmore & Coviello 1999). A broad and holistic understanding of a phenomenon can only be gained if its context of occurrence is carefully studied (Das 1983). Different methods allow flexibility and variety by taking into account the characteristics of the specific research context. Through the different types of data collected and the researcher’s involvement in the projects, a more holistic and thorough understanding of the phenomenon embedded in its context, namely, emerging technology-based service markets, is possible.

Third, the combination of methods allows for data on different aspects of the phenomenon, such as verbal and observed occurrences, written reports, and documentation, and data involving the researcher’s experience in the specific context to be gathered (Gilmore & Coviello 1999). No single method on its own can guarantee the depth and breadth of data necessary to study a phenomenon (Carson & Coviello 1996). The multiple methods and data sources were chosen on the basis of gaining multiple perspectives of market actors on using business models at different points in time. The business model concept and its social and material representations are hence used as devices for both the market actors as well as the researcher to understand social reality. This way, the selected methods form a cohesive multi-method data that is concordant with the moderate constructionist position of the present study. The notion of temporality and the longitudinal research design are elaborated next.
4.4 Temporality and longitudinal research

A key dimension in the research strategy of this study is temporality, and the research is therefore longitudinal. The emerging technology-based services that were examined at the time of conducting this study were not yet commercialized but had been developed and tested. Planning and preparing for the future is critical for the commercial success of services. Hence, understanding the moment at which the services were developed and tested was determined based on their history and future (Halinen & Törnroos 1995: 493).

As discussed in the previous chapters, markets, business nets, and business models are conceptualized as being dynamic, undergoing continuous changes and development through interactions between various market actors. Thus, the notion of time was incorporated into both the research design and methods. The notion of time has been acknowledged to be a key factor in understanding the interactions between market actors and the development of markets (Araujo & Easton 2012, Halinen & Törnroos 2005, Halinen et al. 2012, Medlin 2004, Peters et al. 2012).

The conceptualization of time influences our understanding of business processes (Halinen et al. 2012). Different types of conceptualizations of time exist. These conceptualizations can be considered to have a dualistic nature: social and natural, subjective and objective, and tensed and untensed (Araujo & Easton 2012). Commonly, time is conceptualized merely as sequential and progressive (Peters et al. 2012). However, a more subjectivist view of time has been raised, where time is socially constructed rather than merely a chronology of events (Pettigrew 1990). According to Peters et al. (2012: 731), “time is, first and foremost, both a physical and social construct”, and hence, time is a multifaceted phenomenon involving both “socially constructed subjectivist perspectives and objectivist views of time as a neutral medium”.

This study adopts a relational notion of time (Halinen & Törnroos 1995). Accordingly, time includes the past, present, and future and relates to specific cultural and contextual settings. Actors are at the intersection of the past, present, and future (Araujo & Easton 2012). Each actor uses its own business model that guides and shapes its actions in the present and influences its perceptions of future business opportunities based on past experiences. Therefore, in addition to examining the past activities of the actors and observing their present activities, this study also examines the expectations of the future activities.
Futures studies are based on present ideas of the future, which are influenced by the past and the present (Halinen & Törnroos 1995). Medlin (2004: 187) conceptualizes future time as “composed of many possibilities, each of which shapes the present to some degree and in turn the new possible futures. That is, future time is forever changing and unfolding as present time streams past”. Because the future is still unknown, we need to examine the possible agency of the actors (Peters et al. 2012). The different actors attempt to bring about particular versions of the future to shape action and mobilize resources to make that future a reality (Araujo & Easton 2012). As this study argues, one device for achieving this goal is the business model.

To incorporate the notion of temporality in the research design, a longitudinal research approach is adopted. This approach allows for the understanding of the researcher to develop throughout the research process, building upon what has been learned during the process (Gilmore & Carson 1996). The researcher has been involved in the two projects in which the data have been collected for altogether four years. The data collection and analysis have been conducted in different stages of the process, building on the theoretical and empirical understanding gained in the previous stages. The role of the researcher has been that of an observer instead of an active participant in developing and steering the work in the projects.

A longitudinal research method allows “the present to be explored in relation to the past and the emerging future” (Pettigrew 1990: 272). Longitudinal research provides a sound understanding of the context and the organizations, aiding the interpretation of the findings (Miller & Friesen 1982). Hence, the research design relates to past, present, and future time, with a combination of retrospective, follow-up, and future data. Access to such rich qualitative data was possible because the researcher was involved in the two research projects from their start. The empirical data on the past, present and future are described in greater detail in the next chapter.

4.5 Data collection

Based on the research objective and the research strategy, several data collection methods and sources were employed. The data collection methods used in this study were naturally dependent on the research paradigm as well as the ontological and epistemological assumptions of the study. The methods were chosen based on the need to obtain data that are as rich and holistic as possible.
Data collection methods such as interviews, observation, and questionnaires (with open-ended questions) were used. In addition, a large amount of archival data were collected.

The data were collected at four key stages of the research process and combine retrospective, follow-up, and future data. The data collection took place during the two research projects in which the researcher was involved in 2008-2011. The above-presented key dimensions of the research strategy guided the data collection and analysis.

4.5.1 UBI service pilot

The data of the first research project, UbiLife in 2008-2009, were collected in two main phases, which are elaborated as follows.

Stage 1

The research process was officially initiated at the beginning of 2008 with a preliminary literature review on two theoretical premises: network approach and business models. Along with the literature review, an empirical study that employed the Delphi method was conducted. The aim of the study was to elaborate the concept of business models as understood and used by market actors. In addition, the concept was employed to form future business model scenarios for a specific technology-based service by using a scenario planning technique.

According to the notion of relational time, with an emphasis on the past, present, and future, the study employed the Delphi method and the scenario planning technique used in futures research. Futures research provides one possible methodological perspective for studying business processes apart from historical or follow-up studies (Halinen & Törnroos 1995). According to Bell (1997: 73), “the purposes of futures studies are to discover or invent, examine and evaluate, and propose possible, probable and preferable futures”. The Delphi method is concerned with utilizing experts’ opinions in a structured communication process, which effectively allows a group of individuals to address a complex problem (Linstone & Turoff 1975). Traditionally, the Delphi method has been used to achieve consensus around situations where there is contradictory or insufficient information (Hasson et al. 2000). A major variation of the method is called policy Delphi (Turoff 1975), where opposing views are
debated regarding a complex issue (Loo 2002). The Delphi method was deemed suitable because the business model concept is still highly fragmentary, and studies on its networked nature are scarce. Hence, it was deemed necessary to obtain diversified views on the concept of networked business models, not only based on the literature review but also from managers working with business models in practice. The aim of the study was not to achieve consensus among the experts but to elucidate the business model concept by gathering different perceptions of and opinions about it. Although the Delphi process tends to minimize the feelings and information communicated through face-to-face communication, the process gives individuals a great degree of individuality and freedom from restrictions on their expressions (Linstone & Turoff 1975). Therefore, the respondents are referred to as experts.

Two online questionnaire rounds were conducted that consisted mainly of open-ended questions. The first questionnaire round involved two expert panels. Panel 1 consisted of representatives of the project partners, which included research organizations, high-tech companies, public and policy organizations, and technology producers. The respondents were experts in high-tech business networks and in technology-based services. Panel 2 consisted of managers who were mainly from service industries (e.g., advertising, consulting, and e-business). These managers were used to acquire a more holistic understanding of the general practice of business models in service business. The questionnaire consisted of two parts. First, seven different definitions offered by the existing literature were presented, and the experts were asked to comment on them freely. The definitions were chosen based on their emphasis on perspective (single/focal firm, relationship, or network), manner of representation (normative, general, or context specific), and alternative elements of business models. Second, three open-ended questions were presented concerning these definitions, the elements of business models, and their use in business.

The preliminary results of the first round were presented to the experts during the second round, which had been developed based on the data. The second questionnaire was sent only to Panel 1, as the focus had been narrowed to technology-based services. The questionnaire presented a framework describing the elements of a business model that had been identified based on the data gained from the first round (product/service, actors and their roles, value exchanges, value net, business logic and strategic issues, and the environment). The experts were asked to comment on the framework and a few statements regarding the essence and development of business models in the field of technology-based
services, which had also been formed based on the data from the first round. Finally, the experts had an opportunity to freely answer an open-ended question about business models in general. After the second round, the data were analyzed and reported. The questionnaires can be found in Appendix 1.

After the Delphi study, the scenario planning technique was employed to form alternative business model scenarios for a specific ubiquitous service developed in the project. The technique provides alternative scenarios of how the future may evolve (Moutinho et al. 2002, Schoemaker 1991), and the resulting scenarios can be used to summarize the research results (Bell 1997: 316). The method is especially useful in dynamic markets, as in the case of rapid technological change (Moutinho et al. 2002). Scenarios can be used by managers in decision making and planning for the future. The scenarios were developed in collaboration with the co-author of paper I based on the expertise in marketing and knowledge gained from conducting participant observations during the project. Discussions with a technology expert also took place while the scenarios were developed.

Stage 2

The research process continued during the UBI service pilot in 2009. During and after the pilot, 12 experts involved in developing, testing, and commercializing new technology-based services were interviewed. The interviewees represented eight different actors from both business and non-business organizations involved in the service development net (see Figure 8).
The pilot provided unique data of the net, which was developing new technology-based services for which no clear markets existed to be collected. Being involved in the project from the start, the researcher was able to observe and interview the actors in the net. The data collection was designed to include past, present, and future time, with a combination of retrospective, follow-up, and future data. The new technology infrastructure and services had not been commercialized at the time of data collection, but the business opportunities and the business model were being developed by the actors involved. The perspectives of the past service development and the service pilot (present) are both based on the observation, interview, and archival data. The empirical data on the future (the commercialization of the services) were gathered through semi-structured expert
interviews with 12 managers from eight of the 11 organizations in the project (see Table 3).

Table 3. The UBI service pilot interview data.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Interviewee</th>
<th>Date and duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device manufacturer</td>
<td>Senior Technology Manager</td>
<td>30.6.2009 1 h, 05 min</td>
</tr>
<tr>
<td>Municipality</td>
<td>Project Manager</td>
<td>1.7.2009 1 h, 15 min</td>
</tr>
<tr>
<td>Media broker</td>
<td>CEO</td>
<td>21.10.2009 1 h</td>
</tr>
<tr>
<td>Research project (university)</td>
<td>Project Manager</td>
<td>17.6.2009 55 min</td>
</tr>
<tr>
<td></td>
<td>Account Manager</td>
<td>14.10.2009 1 h, 5 min</td>
</tr>
<tr>
<td>Operator</td>
<td>R&amp;D Manager</td>
<td>6.7.2009 1 h</td>
</tr>
<tr>
<td></td>
<td>R&amp;D Manager</td>
<td>7.7.2009 35 min</td>
</tr>
<tr>
<td></td>
<td>Business Development Manager</td>
<td>11.8.2009 1 h</td>
</tr>
<tr>
<td>Non-profit development organization</td>
<td>Project Manager</td>
<td>17.8.2009 1 h, 10 min</td>
</tr>
<tr>
<td>Development and testing network</td>
<td>Manager</td>
<td>17.8.2009 1 h, 05 min</td>
</tr>
<tr>
<td>Media house</td>
<td>Manager, digital business</td>
<td>14.10.2009 55 min</td>
</tr>
</tbody>
</table>

The interviews adopted a future time dimension and focused on the future expectations and interactions that the interviewed experts considered to be important. The interviews also explored the past and present experiences of the service development and pilot. The managers were asked to describe their experiences in service development and production; to evaluate the business potential, possible actors, and cooperation in commercializing the services; and to evaluate the future expectations of the ubiquitous infrastructure and services. The interview themes can be found in Appendix 2. The role of experts in assessing the future and creating alternative future scenarios is emphasized in futures research (Bell 1997, Linstone & Turoff 1975).

In addition to the interviews, observations were made throughout the research project. The researcher attended monthly project meetings and seminars involving the net. Participant observation was conducted in business meetings in which the future commercialization of the ubiquitous service infrastructure was discussed. An interview with a company in the field of mobile solutions and information management was performed to gain a pre-understanding of the use of business models in commercializing new technology-based services.

The data that were collected during the project and the UBI service pilot are summarized in Table 4 according to the past, present, and future time dimensions. Also shown is the role of the data in understanding the phenomenon.
Table 4. Time perspectives, types, and focus of the empirical data in stages 1 and 2.

<table>
<thead>
<tr>
<th>Time perspective</th>
<th>Data</th>
<th>Focus of the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past</td>
<td>Pre-interview</td>
<td>Pre-understanding of the context and the phenomenon</td>
</tr>
<tr>
<td></td>
<td>12 expert interviews</td>
<td>Past activities and experiences of the actors in the market</td>
</tr>
<tr>
<td></td>
<td>Delphi questionnaires</td>
<td>Conceptualization of the business model</td>
</tr>
<tr>
<td>Present</td>
<td>12 expert interviews</td>
<td>Activities and experiences of the actors in the service development net</td>
</tr>
<tr>
<td></td>
<td>Observation and archival material during the project</td>
<td>Activities of the actors in service development net, and understanding of the market</td>
</tr>
<tr>
<td>Future</td>
<td>Delphi questionnaires</td>
<td>Conceptualization of the business model</td>
</tr>
<tr>
<td></td>
<td>12 expert interviews</td>
<td>Expectations for the future business model, net, and market</td>
</tr>
<tr>
<td></td>
<td>Participant observation in meetings</td>
<td>Expectations for the future business model, net, and market</td>
</tr>
<tr>
<td></td>
<td>Delphi questionnaires</td>
<td>Conceptualization of the business model</td>
</tr>
<tr>
<td></td>
<td>Scenario planning</td>
<td>Expectations for the future business model and net</td>
</tr>
</tbody>
</table>

4.5.2 IT service development

During the second project, ProForm in 2010-2011, the data were also collected in two main stages, which are elaborated next.

Stage 3

The ProForm project began by following the initiatives of the Finnish government to promote the development of additional service offerings across more traditional product-oriented sectors (see the Finnish Funding Agency for Technology and Innovation). The project attracted four company partners, whose service development activities the researcher followed. A fifth company (Com Co.), not financially involved in the project, was included as an additional site of inquiry. The company details are presented in Table 5 (for confidentiality, the company names have been replaced with pseudonyms).
Table 5. Company details.

<table>
<thead>
<tr>
<th>Company</th>
<th>Offering</th>
<th>Market</th>
<th>Aim of the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Co.</td>
<td>IT consultancy and software services</td>
<td>IT service market (in a variety of sectors)</td>
<td>Development of a collaboration facilitation service</td>
</tr>
<tr>
<td>Consult Co.</td>
<td>IT products and services</td>
<td>IT service market (in a variety of sectors)</td>
<td>Development of a quality assurance service offering and a mobile application for the finance sector</td>
</tr>
<tr>
<td>Equip Co.</td>
<td>Design and manufacture of truck-mounted equipment</td>
<td>Industrial and public sector markets</td>
<td>Development of maintenance and telecontrol services</td>
</tr>
<tr>
<td>Tec Co.</td>
<td>Digital solutions for innovation, internal communication, and training purposes</td>
<td>IT service market (in a variety of sectors)</td>
<td>Development of an online portal for marketing and selling 'neighborhood' services</td>
</tr>
<tr>
<td>Com Co.</td>
<td>Visual communication services</td>
<td>Communications market</td>
<td>-</td>
</tr>
</tbody>
</table>

Data were collected regarding the activities of the actors as they went about their work. To gain an understanding of the markets and the companies’ service development activities, interviews were conducted at different stages of the service business and offering development (except for Com Co.). During the first stage (stage 3 in the overall research process), nine interviews were conducted, of which six were conducted in collaboration with a co-researcher and three were conducted by other co-researchers in the project. The interview data are presented in Table 6.

Table 6. First set of IT service development interview data.

<table>
<thead>
<tr>
<th>Company</th>
<th>Interviewee</th>
<th>Date and duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Co.</td>
<td>Consultancy manager</td>
<td>19.11.2010 1 h, 20 min</td>
</tr>
<tr>
<td></td>
<td>Business development manager and consultant</td>
<td>19.11.2010 1 h, 30 min</td>
</tr>
<tr>
<td>Consult Co.</td>
<td>Vice President and Consultant</td>
<td>10.11.2010 1 h, 40 min</td>
</tr>
<tr>
<td>Equip Co.</td>
<td>Service manager</td>
<td>30.11.2010 55 min</td>
</tr>
<tr>
<td></td>
<td>CEO</td>
<td>30.11.2010 30 min</td>
</tr>
<tr>
<td></td>
<td>Development manager</td>
<td>30.11.2010 1 h, 5 min</td>
</tr>
<tr>
<td>Tec Co.</td>
<td>CEO</td>
<td>10.11.2010 1 h, 20 min</td>
</tr>
<tr>
<td>Com Co.</td>
<td>Development manager</td>
<td>21.12.2010 1 h, 40 min</td>
</tr>
<tr>
<td></td>
<td>CEO</td>
<td>4.4.2011 45 min</td>
</tr>
</tbody>
</table>
The interviews covered themes concerning their efforts in the development of services and service business. The interviewees were asked to describe how they develop their services and service business and their expectations for the future service market. They were also asked to tell a story about developing a specific past service-based offering, whether successful or unsuccessful. The interview themes are presented in Appendix 3.

**Stage 4**

In the final data collection stage, a second round of interviews regarding the specific service development efforts that had taken place during the project was conducted (see Table 7). While aiming to gain a deeper understanding of the service development activities in collaboration with a central partner (also the customer), additional interviews were conducted with one of the companies’ public sector customer. The key representatives of a municipal organization, the City of Lakeside, were interviewed once the service pilot had been completed. All interviews were conducted by another researcher of the research project. The interviewees were asked to describe the service development activities in collaboration with the other actors. The interview themes can be found in Appendix 4.

**Table 7. Second set of IT service development interview data.**

<table>
<thead>
<tr>
<th>Company</th>
<th>Interviewee</th>
<th>Date and duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Co.</td>
<td>Consultancy manager</td>
<td>19.8.2011 55 min</td>
</tr>
<tr>
<td></td>
<td>Consultant</td>
<td>19.8.2011 1 h</td>
</tr>
<tr>
<td>Consult Co.</td>
<td>Vice president</td>
<td>19.8.2011 1 h, 10 min</td>
</tr>
<tr>
<td>Tec Co.</td>
<td>CEO</td>
<td>19.8.2011 30 min</td>
</tr>
<tr>
<td>City of Lakeside</td>
<td>Development manager</td>
<td>28.9.2011 30 min</td>
</tr>
<tr>
<td></td>
<td>Manager</td>
<td>28.9.2011 30 min</td>
</tr>
</tbody>
</table>

In two of the companies (IT Co. and Consult Co.), Delphi questionnaires were conducted among the company representatives, partners, and customers to determine the imagined future changes to the business model elements. Both studies consisted of two online questionnaire rounds that examined a five-year period up to 2016. The first round consisted of future statements and open questions concerning the networked business model elements as well as the IT service markets. In the second round, the experts’ answers regarding each of the
themes were elaborated upon. In addition, further statements and questions were presented concerning the essence of business models. The themes of the questionnaires can be found in the Appendix 5.

Both studies included panels of experts representing the key actors in the service development: the company, partners, research institutions, and customers. Fifteen experts from IT Co. were involved. In the first round, 11 of the experts responded to the questionnaire, and in the second round, nine responded. There were 12 panel experts from Consult Co. In the first round, 11 of the 12 experts responded, and in the second round, nine of the 12 responded.

As in the previous project, observation played a critical role throughout the data collection in stages 3 and 4. The researcher was involved in the project from the start and participated in monthly project meetings among the researchers. In addition, the researcher took part in the management meetings with the company representatives, in which everyone reported the progress of the service development projects in each company. During the project, two workshops were held with company representatives and researchers. In the first workshop, a scenario-based approach was used to envision the future business models for the services under development. In the second workshop, discussion with the company representatives concerning the service business development activities took place. A third workshop was held with the research group. This workshop produced additional data on service business development based on existing theoretical and empirical knowledge. The workshops provided additional understanding of the actors’ (companies and research partners) activities in developing the service businesses. Additionally, internal and publicly available documents were collected, which played a central role in examining the companies’ business models and the market. These data included web pages and brochures, project reports, press releases, annual and interim reports, strategy documents, and slideshows. The data that were collected during the project and the IT service development efforts are summarized in Table 8 according to the past, present, and future time dimensions. Also shown is the role of the data in understanding the phenomenon.
Table 8. Time perspectives, types, and focus of the empirical data in stages 3 and 4.

<table>
<thead>
<tr>
<th>Time perspective</th>
<th>Data</th>
<th>Focus of the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past</td>
<td>First and second sets of interviews</td>
<td>Activities and experiences of the actors in past service development</td>
</tr>
<tr>
<td>Archival material</td>
<td></td>
<td>Understanding the market</td>
</tr>
<tr>
<td>Present</td>
<td>First and second sets of interviews</td>
<td>Activities and experiences of the actors in service development and the market</td>
</tr>
<tr>
<td>Observation</td>
<td></td>
<td>Activities of the actors in service development and the market</td>
</tr>
<tr>
<td>Archival material</td>
<td></td>
<td>Understanding the current business model and the market</td>
</tr>
<tr>
<td>Future</td>
<td>First set of interviews</td>
<td>Expectations on future changes in the market</td>
</tr>
<tr>
<td>Delphi questionnaires and workshops</td>
<td></td>
<td>Expectations on future changes in the market and the business model</td>
</tr>
<tr>
<td>Workshops</td>
<td></td>
<td>Expectations on future changes in the market and the business model</td>
</tr>
</tbody>
</table>

4.6 Data analysis

There are a variety of strategies and techniques for analyzing qualitative data. For example, Miles and Huberman (1994) consider the analysis to consist of three flows of activities: reducing data, displaying data, and drawing and verifying the conclusions. Reduction refers to the selection, focus, simplification, abstraction, and transformation of the data. Display refers to an organized assembly of information for drawing conclusions. Conclusions may be drawn throughout the data collection process, and conclusions need to be verified as the analysis proceeds. This conceptualization of data analysis provides a thorough understanding of the process of analysis in parallel to data collection.

Coffey and Atkinson (1996) make an important distinction between organizing and handling data, and interpreting data. The procedures and tasks in data handling consist of coding, indexing, and retrieving data as well as other manipulations of the data. Data interpretation, on the other hand, is more speculative and imaginative, consisting of the “reconstruction of social worlds” that often emphasizes “the unique rather than regularities of incidence or pattern” (Coffey & Atkinson 1996: 7). This study uses both of these tasks, starting with organizing the data and proceeding to interpreting the data. The NVivo software was used in organizing and categorizing all written data.
For the different stages of the research process, the data analysis was performed based on the collection method and nature of the data. All interviews that were conducted during the two projects and the observed business meetings for UbiLife were audiotaped and transcribed. However, there were some differences in the data analysis, and hence, the key procedures in the analysis are described according to the stages of the data collection.

The data obtained from the Delphi questionnaires (stages 1 and 4) were analyzed between the rounds, and the results were presented after both rounds to the experts for them to justify or alter their answers. The analysis first codified the data into themes, such as the elements and characteristics of business models, and then combined the themes into broader categories. Each theme was written out as a story, or a narrative, and illustrated figuratively.

The data that were obtained from the UBI service pilot (stage 2) were first organized by content coding according to the key concepts of the study (Coffey & Atkinson 1996). Content analysis refers to examining “artifacts of human communication” in written documents or transcriptions (Berg 1995: 174). While coding the data according to the theoretical framework, including the business model elements, the business net, and business opportunities, ‘artifacts’ of the phenomenon were allowed from the data, such as experiences in service development and interaction with other actors. Codes assign meaning to the descriptive or inferential information compiled during the study (Miles & Huberman 1994). The coding began as descriptive codes but proceeded toward more interpretive and explanatory (pattern) codes as the understanding of the researcher evolved and knowledge gained from observation was exploited in reviewing the descriptive codes. The explanatory codes were further analyzed by theme-based categorization (e.g., Braun & Clarke 2006). The interview guide served as the first thematic schema, but themes also emerged from the data. For example, the preliminary interview raised the issue of changing actors between the service development and market phases.

All interview data that were collected from the ProForm project (stages 3 and 4) were first organized in a similar manner, as described above for UbiLife. This approach allowed the researcher to become familiar with the data and to gain a thorough understanding of the context and activities of the actors. After the preliminary data analysis, a more in-depth interpretation of the data was made (although some level of interpretation took place in the process of collecting and coding the data). According to Coffey and Atkinson (1996: 47), moving from coding toward interpreting involves “the transformation of the coded data into
meaningful data”. In interpreting the data, the researcher identified ways in which the actors used their business model elements and how they presented the business model (or elements of it) to different groups. The analysis itself can be regarded as representing social phenomena. Hence, the researcher also produced representations of the data in the analysis. Thus, the aim was to identify chains of translation between the ‘big idea’ of the business and the specific activities of the actors as they developed new service offerings and shaped or innovated markets for the services.

As part of the analysis, the study employed the Social Construction of Technology (SCOT) approach (Pinch & Bijker 1984). SCOT is a program of research that adopts a practice-based approach to studying the social construction of knowledge. According to SCOT, the development of technological artifacts is an alternation of variation and selection involving multiple actors (social groups) identifying problems and solutions concerning the technological artifacts (selection). Thus, the analysis involved developing an understanding of the different actors in contemporary market development and the controversies (problems and solutions) that emerged as managers took action in creating the offerings. The following section provides an overview of the individual research papers included in this thesis.
5 Overview of the papers

The thesis is composed of three original research papers. The research questions are answered based on these papers. Each paper also addresses its own research problem. The papers’ specific research questions, the main results of each paper, and the contribution of the papers to each of the sub-questions are elaborated in Table 9. Before answering the sub-questions and the main research question in Chapter 6, the research papers are summarized in the sections that follow.

Table 9. Roles of the papers in the current study.

<table>
<thead>
<tr>
<th></th>
<th>Paper I</th>
<th>Paper II</th>
<th>Paper III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papers’ specific</td>
<td>How to conceptualize</td>
<td>How does a net of actors develop a business</td>
<td>How do business models frame action in emerging</td>
</tr>
<tr>
<td>research question</td>
<td>business models from a network perspective?</td>
<td>model for an emerging technology-based service?</td>
<td>technology-based service markets?</td>
</tr>
<tr>
<td>Result</td>
<td>Framework of the elements of a networked</td>
<td>Framework of phases, levels and dimensions of</td>
<td>Identification of ways in which business models</td>
</tr>
<tr>
<td></td>
<td>business model and networked business model</td>
<td>networked business model development</td>
<td>frame action in markets</td>
</tr>
<tr>
<td></td>
<td>scenarios</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contribution to 1. sub-question: essence</td>
<td>Structure (identification of elements based on the empirical study, scenarios); Networked (shared in the net) and temporal (future scenarios)</td>
<td>Structure (using the elements identified in paper I) and narrative (business model development); Networked (interlinked and shared among market actors) and temporal (evolution of the elements in time)</td>
<td>Structure (theoretical framework of business model elements and narrative (evolution and connections of the elements in empirical data)); Temporal (evolution of the elements in time)</td>
</tr>
<tr>
<td>Contribution to 2. sub-question: levels</td>
<td>Organization (perspectives of different market actors); Business net (networked business model elements and scenarios describing the net)</td>
<td>Organization (perspectives of the market actors in the net); Business net (evolution of the service development net into a business net)</td>
<td>Organization (perspectives of the companies); Market (changes in the IT and industrial service markets)</td>
</tr>
</tbody>
</table>
5.1 A network perspective on business models for emerging technology-based services (paper I)

Research paper I examines the business model concept from a network perspective. The aim of the paper is to conceptualize a ‘networked business model’. This conceptualization was also an essential starting point for the thesis because before the business model concept and the use of business models could be examined, it was important to establish the theoretical underpinnings of the concept.

Therefore, the study draws on the network approach and, more specifically, on business nets. The net perspective was deemed useful because it acknowledges the role of the focal firm in setting up the net, but it still considers the specific net of actors aiming to develop, produce, and market a new technology-based service offering. The two theoretical discussions on networks and business models were found to be strongly interconnected. Networks represent a key element of business models, and the previously identified elements of business models overlap with concepts used in the network approach. In addition, the notion of modularity is incorporated because it can facilitate the understanding of networked business models composed of different elements.

Empirically, the paper is divided into two parts. First, the study identifies the core elements of a networked business model using the Delphi method. Expert perspectives on the concept and role of the business model within the organization and in the business net are gathered in two online questionnaire rounds. Based on these data, the generic core elements of a networked business model in the context of technology-based services are identified. Second, the study shows how the elements can be used in business development in the field of
ubiquitous services. Two alternative networked business model scenarios are formed and discussed.

A networked business model reflects a situation where it is impossible for a single company to govern all the relevant resources and activities needed in developing, producing, and marketing technology-based services. Such a concept can represent a device for facilitating the development of business for new technology and technology-based services. A networked business model is shared among multiple market actors in the net. This study develops an empirically grounded conceptualization of a networked business model that identifies a set of generic core elements of a networked business model (structure) and their relations (narrative): the service, customers, market actors and their roles, and the activities between them. The service is a key element of a business model for determining what kinds of actors and activities are needed. In addition, business models do not exist in isolation but are interlinked with the surrounding business environment. Business models are developed and adjusted according to the environment – the market.

5.2 Networked business model development for emerging technology-based services (paper II)

Research paper II examines networked business model development for emerging technology-based services. The paper follows the understanding gained from networked business models from the previous study. Dynamics were found to be key to understanding business models, and this study follows this line of thought.

This paper draws on literature on business models from the business net perspective. The study also makes use of literature on business opportunities as part of the networked business model development. The study suggests that a networked business model is developed in cooperation with actors involved in the development, production, and commercialization of emerging technology-based services to exploit a business opportunity.

The empirical part of the paper represents a longitudinal study that utilizes retrospective and real-time data, and expectations of future outcomes are examined. At the time of conducting the study, the technology-based services were being developed and tested in a pilot, but their future commercialization potential had not yet been established. Hence, the future perspective is emphasized in the data.
As a result, the concept of a networked business model is elaborated as a dynamic device in developing an emerging business in a net of actors. Business models incorporate the past, present and future, and hence are temporal. Business models can be developed in a net of actors for emerging technology-based services by using a networked business model as a device in forming the net and creating markets. For example, the business model can be used in acquiring potential new and existing actors and creating a collective understanding in the net of what needs to be done. The study identifies the phases of business net evolution when business opportunities are identified, created, and potentially exploited as service development, pilot, and market phases. The networked business model development comprises two levels (the firm and the net) and two dimensions of development (business net and business opportunity). Business models illuminate business development by describing the development phases at different levels. Networked business models also emphasize the role of an entrepreneurial actor in setting up the net and the distributed nature of entrepreneurial activities across the net.

5.3 Innovating markets by putting business models to work (paper III)

Research paper III continues elaborating the use of business models as a device in a business net and a market. This study set out to understand the ways in which the business model can be used by actors in their efforts to develop new service offerings in new markets.

The purpose of this research is to explore how business models are developed and put to work as frames for action in ways that shape markets. The study draws on the business model literature and framing theory, which is largely based on sociology and the social movement theory. Business models are conceptualized as frames for action. The business model elements represent a way of framing what the business includes and are thus put to work by managers as they try to work out what to do next. The business model framework developed by Mason and Spring (2011), comprising technology, market offerings, and network architecture, is used in the study because it is a simple and comprehensive way of understanding the key elements of a business (structure). By looking at how the different elements are disassembled and reassembled in different ways (narratives), it is possible to better understand how market actors experiment in and shape a market.
The study follows the development and use of a business model to conceptualize, mobilize, and create new service-based offerings in three companies operating in the IT and industrial service markets. The empirical data were collected through interviews, observation, and documentation. The data were collected during the two-year research project.

The paper presents findings that show the framing and reframing of business models and their elements as they are put to work as frames for action. Business models can be put to work as diagnostic, prognostic, and motivational devices and, in so doing, can be transformed into business activities. This dynamic facilitates our understanding of the business model as a device in the business net and the market, that is, the way in which the business model is used by the actors in the net influences the cooperative efforts in developing, testing, and marketing new service offerings.
6 Discussion

This chapter starts by answering the research questions. The theoretical and managerial implications are presented, followed by the evaluation of the study. Finally, the limitations and future research avenues are discussed.

6.1 Summary of the results

The overall objective of this study was to understand the use of business models by showing the ways in which market actors use business models in the emerging technology-based service context. To achieve this objective, the study presented the following main research question: “How do market actors use business models in emerging technology-based service context?” The study approached the research question through three sub-questions: 1) “What is the essence of business models?”, 2) “At which levels do market actors use business models?”, and 3) “What kinds of activities do market actors perform with business models?” The study answers the research questions based on the theoretical and empirical understanding gained through the three original research papers. The three sub-questions are addressed in the following section, after which the answer to the main research question is presented.

What is the essence of business models?

To understand the use of business models, it is important to discuss what business models are in the hands of market actors. While much of the extant studies on business models has focused on conceptualizing and identifying the elements of business models (e.g., Hedman & Kalling 2003, Osterwalder et al. 2005, Shafer et al. 2005), they have attempted to make universal but limited definitions of the concept. The business model literature that appeared after the dotcom boom has conceptualized business models as rather static descriptions of the specific business of a company, (e.g., Afuah & Tucci 2001, Timmers 1998, Weill & Vitale 2001). Only the most recent developments in the literature have begun to acknowledge the differing roles of business models (e.g., Baden-Fuller & Morgan 2010, Doganova & Eyquem-Renault 2009) instead of definitions or classifications of business model elements.

However, despite the contributions of existing business model research, the research still falls short of conceptualizing business models in terms of how they
Business models have been conceptualized, for example, as schemas (Freytag & Clarke 2011) and cognitive mechanisms (Tikkanen et al. 2005) incorporating the more dynamic nature of business models and their possibilities to guide the actions of market actors. Osterwalder’s business model canvas (Osterwalder et al. 2010), on the other hand, is a practitioner-oriented view on business models, which has also influenced the understanding of market actors on business models. The current study complements this understanding of business models and explicates the essence of business models instead of merely defining business models based on their elements. According to the results of the present study, business models are analytical devices. Business models do not exist without their users, as they are devices that market actors use. The dynamics of the business model concept are clear: business models can bring about change as well as stabilize the actions of market actors.

Based on the results of the study, the essence of business models incorporates perspectives on and characteristics of business models. Business model can be perceived as structures and narratives. In addition to determining the elements of a business model - the structure - it is important to understand the relations of the different elements. By unpacking and reassembling business model elements in different ways, a business model can tell narratives of how a business works or should work and thus create a shared understanding among actors. As stated, although much of the extant research on business models has identified different sets of business model elements (structures), it has neglected the other side of business models as narratives. Magretta (2002) is one of the only researchers to have shed light on the narrative side of business models, which this study complements. Morgan (e.g., 2001, 2005) has done extensive work on understanding the essence of models, which is applicable to the understanding of business models. Market actors, be they companies, research institutes or financing bodies, look for the ‘right’ business models in developing and marketing new technology-based services and describing the elements of business models, but at the same time they tell stories to different groups of actors about how these elements fit together (i.e., a business model can be a structure or a narrative of a desired future state of business to persuade other market actors to, e.g., invest in a business).

Based on the results of the present study, business model as a structure and a narrative can be characterized as temporal and networked. Although the dynamics of business models have been widely recognized (e.g., Cavalcante et al. 2011, Demil & Lecocq 2010), the temporal characteristics of business models have been
neglected. This study shows that business models are temporal; they incorporate past, present, and future time perspectives. Business model as a structure can represent snapshots at different points in time, and as a narrative it can describe the evolution in time. A business model in the present is used to learn from past experiences as well as plan for the future. Business models also create temporary stability for the future business to be realized. Thus, business models are also devices for actualizing the future.

Another characteristic of business models is their networked nature. A business model is not merely internal to a company but external. Business models are networked by being interlinked with the business models of others as well as for being shared by market actors internally and externally. A networked business model is a device that creates a shared understanding among the market actors with a structure or a narrative, e.g., concerning their roles and activities in the net, the service offering, and their relations to each other and to the networked market. The essence of business models is described in Figure 9.

Fig. 9. The essence of business models.

In summary, the essence of business models is multifaceted. First, a business model is an analytical device for market actors to understand business in emerging technology-based service context. In addition, a business model is
perceived as both a structure and a narrative, and has both temporal and networked characteristics.

At which levels do market actors use business models?

Market actors use business models at different levels of business in emerging technology-based service context. These levels must to be elaborated on to understand the use of business models. Although the business model literature is fragmented and comprises a wide range of fields, the concept is still largely captured or restricted to a company level and used to describe a value creation logic or architecture of a company (e.g., Amit & Zott 2001, Chesbrough & Rosenbloom 2002). Only a few studies have identified different levels, besides that of a single company, at which business models are used (see Mason & Spring 2011). The current study enriches this understanding by viewing the concept from a network perspective (e.g., Håkansson et al. 2004, Jarillo 1988, Möller & Rajala 2007) and within markets (e.g., Araujo et al. 2010a, Kjellberg et al. 2012). Although the extant literature on business models has identified networks as a key element of business models from a single company’s point of view (Amit & Zott 2001, Chesbrough & Rosenbloom 2002, Shafer et al. 2005), only a few studies have addressed the role of business models in the network (see Mason & Spring 2011, Nenonen & Storbacka 2010) and the market (see Doganova & Eyquem-Renault 2009).

This study furthers this understanding by explicating the use of business models at the level of an organization, business net and market (see Figure 10). This study emphasizes the emerging technology-based service as the key element in business models - what kinds of actors are needed to develop, produce and market the service. As a result, it is clear that business models are also used at other levels besides that of the single firm. Business models are used at the business net and market levels where market actors form business nets and take actions to shape a market. A business model analyzes the market actors, their roles in the net, the activities between the actors, and the technology-based services and their market.
Fig. 10. Levels at which market actors use business models.

Thus, a business model is not only internal to a company but also embedded in the net and the market. Hence, market actors use business models at three distinct levels: the organization, the business net, and the market. The different levels are interrelated and need to be understood to facilitate the use of business models.

What kinds of activities do market actors perform with business models?

Following the understanding of the business model concept and perceiving business models as analytical devices; the answer to this question elaborates the activities in which market actors use business models. Although the extant literature has identified the need to understand why and how business models are used (Baden-Fuller & Morgan 2010, Doganova & Eyquem-Renault 2009), discussion on the activities which market actors perform with business models is almost non-existent. The roles that business models play in companies have been distinguished as recipes, scientific models, and scale and role models (Baden-Fuller & Morgan 2010), and the functions of business models have been
identified to articulate the value proposition, identify the market segment, define the structure of the value chain, estimate the cost structure and profit potential, describe the position of the firm within the value network, and formulate the competitive strategy (Chesbrough & Rosenbloom 2002). Morris et al. (2005) have also distinguished the roles of business models at the economic, operational, and strategic levels of a company. However, this study shows that business models are part of important activities at other levels besides a company as well.

As a result, this study distinguishes between the types of activities that market actors perform with business models. First, business models are used in developing and stabilizing business. As part of the development and stabilization, business opportunities, e.g., in the market, must be identified, developed and exploited in the business model. In parallel to developing and stabilizing business, business models frame action for different purposes and for different audiences. Drawing on the framing perspective, business models can be used to diagnose problems, prognose solutions, and even motivate collective action, and in so doing, are transformed from models into business activities in ways that can develop and stabilize business in an organization, net and market.

Second, this study identifies three sets of activities according to the levels in which business models are used: 1) organizing business in an organization; 2) forming and coordinating a business net; and 3) experimenting in and shaping a market. This study supports the extant research, which has recognized the need for companies having business models to organize their business within the boundaries of the company and in relation to their network (e.g., Amit & Zott 2001, Chesbrough & Rosenbloom 2002, Shafer et al. 2005). Following the more recent developments in the business model literature focusing on the ways in which business models can be changed or new models can be innovated for a company to profit from a specific offering (e.g., Chesbrough 2010, Johnson et al. 2008, Teece 2010), this study explicates how business models can be developed in a net of actors identifying, developing and exploiting business opportunities. The results of the present study add to the business model literature by showing that as part of this development, business models are useful in a net to form and coordinate actions within the net to develop, produce, and market an emerging technology-based service. For example, a business model can be used in acquiring potential new and existing actors and creating a shared understanding in the net of what needs to be done, e.g., in identifying and developing a business opportunity in the market.
Moreover, business models are useful in markets. Research on business models has identified the boundary spanning role of business models (Zott & Amit 2010) in acting as innovation devices (Doganova & Eyquem-Renault 2009) and as interaction interfaces with other market actors (Storbacka & Nenonen 2011b). This study complements this understanding by showing that business models are useful for market actors to experiment in a market with alternative structures and narratives of business models and to shape a market for emerging technology-based services by creating a shared understanding of a future market and mobilizing collective action among market actors accordingly. The activities that market actors perform with business models are summarized in Figure 11.

**Fig. 11. Activities that market actors perform with business models.**

In summary, the activities that market actors perform with business models in emerging technology-based service context can be distinguished in two ways. Market actors 1) develop and stabilize business with business models (including the identification, development and exploitation of business opportunities) and 2) frame action with business models (including diagnosis, prognosis, and motivation). The activities can be further distinguished between three levels of using business models. Market actors 1) organize business in an organization with business models, 2) form and coordinate a business net with business models, and 3) experiment in and shape a market with business models. Although the focus in this study is on activities in emerging technology-based service context, business models can also be used in business-as-usual activities (e.g., Morris *et al.* 2005).
How do market actors use business models in emerging technology-based service context?

Finally, through the answers to the sub-questions, the answer to the main research question is presented. Despite the valuable insights on the concept and development of business models, scholars have mostly focused on whether the correct business model was developed or ‘found’ in explaining failures or successes in commercializing new technology-based innovations (e.g., Chesbrough & Rosenbloom 2002, Osterwalder et al. 2010). Only a limited amount of research has suggested that such explanations may lay in the use of business models (Doganova & Eyquem-Renault 2009). This study adds to this knowledge by elaborating how market actors use business models in emerging technology-based service context and reveals variation in the use of business models.

Despite the contributions of the existing studies, the business model literature has failed to elucidate the ways in which business models are used within and outside an organization (see Doganova & Eyquem-Renault 2009, Mason & Spring 2011). This study adds to this yet very limited body of knowledge. Business models can be used as structures and narratives in different activities, at different levels that are interlinked and in which business models are shared, in relation to past, present and future.

Market actors use business models as structures and narratives. They develop and stabilize business in parallel to framing action with business models. Business models are used to develop business (including emerging business nets and markets) for emerging technology-based services. However, at the same time, market actors aim to stabilize the desired state of business (turn into business-as-usual). In doing this, they use business models to frame action.

Business models are also used at other levels besides that of the single firm. In an organization, business models can be used to analyze business internal to the organization, and external from the perspective of the organization. This is the most common level of analysis in existing research on business models (e.g., Amit & Zott 2001). However, this study shows that business models can also be used as analytical devices at business nets and markets. At the level of the net, business models can be used to coordinate and mobilize actors to form business nets to develop, produce and market emerging technology-based services. At the level of the market, business models can be used to experiment in and shape markets for emerging technology-based services. At these levels, business models
are interlinked and shared by multiple actors (networked character). Business models are used in relation to the past, present and future. The results of the study are summarized in Figure 12.

**USE OF BUSINESS MODELS IN EMERGING TECHNOLOGY-BASED SERVICE CONTEXT**

**6.2 Theoretical contribution**

This study has examined the use of business models, and makes four key theoretical contributions. In the following section, each of these contributions is discussed in detail.
Integration of business models into the network approach and market studies literature in marketing

First, this study contributes to the business model literature by integrating the business model concept into the network approach and market studies literature in marketing, revealing novel perspectives on business models. This study shows there is synergy between business model research and the marketing discipline. Hence, business models and their use can be understood more thoroughly by drawing on the above-mentioned discussions in marketing. As has been noted in previous studies, the business model literature lacks an intellectual home (Teece 2010), and there have been limited attempts to integrate the concept into the marketing discipline (Coombes & Nicholson 2013, Nenonen & Storbacka 2010). This study is among the first to address these issues (see e.g., Mason & Spring 2011, Storbacka 2011), with the explicit aim of understanding the use of business models in marketing. In addition, the few calls for engaging marketing with business model research have focused on value co-creation (Coombes & Nicholson 2013). However, this study incorporates two contemporary and widespread discussions of marketing, namely the network approach (e.g., Håkansson et al. 2004, Jarillo 1988, Möller & Rajala 2007) and market studies (e.g., Araujo et al. 2010a, Kjellberg et al. 2012), which are central to understanding how market actors connect emerging technology-based offerings with markets—a topical question in marketing. Thus, the study shows that business models are useful analytical devices for understanding the formation of business nets and market dynamics. This way this study complements the limited understanding of business models as market and network devices (Doganova & Eyquem-Renault 2009, Mason & Spring 2011).

Conceptualization of business models

Second, the study contributes to the business model literature by explicating the concept of business model. Recently, the focus in business model research has shifted toward business model innovation and development (e.g., Chesbrough 2010, Johnson et al. 2008, Teece 2010). Despite these valuable insights on the dynamic and changing character of business models, scholars and practitioners still focus much on whether the development of a business model was successful or not when explaining failures or successes in commercializing new technology-based innovations. Only a very limited amount of research has been directed
toward the practice and use of business models (Doganova & Eyquem-Renault 2009, Mason & Spring 2011) in explaining such failures or successes. This study enriches this understanding by revealing the flexibility of business models.

Business models can be conceptualized on several continuums of their characteristics: stable vs. changing, objective vs. subjective, and independent vs. interdependent. Business models are dynamic, i.e., they are constantly being changed or bring about change. However, business models are also stable, i.e., they have a description or a shared way of doing things (routines). Business models can be viewed as objective reality as in much of the extant literature, i.e., they need to be transformed for new offerings, yet they are also subjective, i.e., they do not exist independent of their users but are used to understand reality. Finally, business models can be independent of other actors, i.e., internal to an organization, but they are also interdependent, i.e., networked. Business models are not necessarily either/or (e.g., either stable or changing). Rather, it is the balance between these extremes that we must understand to use business models.

**Dynamics of business nets**

Third, this study contributes to the network approach by explicating the nature and formation of business nets by examining the use of business models in business nets. This study identifies a device that actors can use in coordinating and shaping the actions of others in the net. Previous studies have considered emerging business nets as dynamic, characterized by radical and discontinuous changes (Möller and Rajala, 2007). Adopting the dynamic view of networks and nets, this study suggests that a business model can function as a device in creating a net and supporting its evolution toward becoming a viable business net. As a business model is developed and shared with others, it can be used to frame the actions of customers, suppliers, and users to enroll and mobilize them to coordinated actions. By reproducing the business model, a shared understanding of the future intentions may be created in the net to develop, produce, and market the emerging technology-based service.

This finding adds to the prior literature on the dynamics and formation of networks (e.g., Lundgren 1992, Möller et al. 2005) and to the temporal notion in networks (e.g., Araujo & Easton 2012, Halinen & Törmöros 1995, Halinen et al. 2012). Furthermore, a business model can be reproduced by entrepreneurial actors who represent the elements in different ways to different actors, creating opportunities concerning the business model elements and facilitating the
evolution of the business net. Thus, entrepreneurial activities become dispersed throughout the net (see Garud & Karnøe 2003).

**Dynamics of markets**

Fourth, the study contributes to the market studies literature. The study adds to our understanding of market dynamics by incorporating the business model concept. Instead of viewing markets as existing, ready to be identified for new technology-based services, this study has adopted a more dynamic view, with an emphasis on the future: future markets need to be imagined and innovated. For future markets to be realized, the markets need to be shaped. Thus, this study complements the work of the market studies group (Araujo et al. 2010a, Araujo 2007, Kjellberg & Helgesson 2006, Kjellberg et al. 2012) by showing, at least partially, that by employing a business model as an analytical device, we can better understand the ways in which markets are shaped. By sharing business models, actors can temporarily stabilize the relationships between them to enable them to imagine a future market and plan their future intentions. This finding also complements the understanding of markets in the INA, with markets as networks of actors (Easton 2004, Håkansson et al. 2004, Möller & Halinen 1999).

### 6.3 Managerial contribution

This study offers managerial implications for companies and managers operating in dynamic and uncertain technology-based markets. As has been noted, the business model concept is often used in everyday business to refer to a variety of issues such as business plans, business concepts, revenue logics, and so on. Furthermore, business models have been widely acknowledged to be a key factor determining the success or failure of companies, especially in technology fields because of the rapid technological developments. For example, Apple has been used in many course books and even in scientific articles as an example of the success of their underlying business model: instead of focusing on the sales of products (iPods), Apple has succeeded in developing a business model for ‘digital music’, combining the technology (hardware and software) with the service. The example of Apple’s business model demonstrates that in addition to great technological innovations, the design of the business model is critical. However, instead of giving managers formulas for building the ‘right’ type of business model for emerging technology-based services to turn the technological
applications into growing profits, this study provides a more profound understanding of the possibility for companies and their business nets to use business models.

First, this study furthers managers’ understanding of the concept of business models. It is not enough to have the ‘right’ type of business model or to transform or develop a ‘successful’ business model; managers must also understand the ways in which they can use business models in planning and conducting business in dynamic markets. A business model and its elements, however they are defined, provide one type of device for companies to manage their business. By analyzing the business according to the different business model elements, managers can identify strengths and weaknesses in the business and the net. In addition, by disassembling and reassembling the business model elements in different ways, managers can experiment with different types of business scenarios. Examining the connections between the business model elements is another way of understanding the dynamics of business models: a company’s business model is not a static model of the business or the net but is a device for the company to conduct business in the net and the market.

Second, therefore, a business model is a valuable device for companies to use in a networked market. It can be used to communicate and interact with other actors in the market, e.g., companies that they wish to take part in the new venture and financing bodies, or ‘business angels’, when considerable funding is needed, for example, in the development of an innovative new technology-based service. A business model and its elements need to tell a compelling narrative of how the business works or may work in the future. The business model representations that managers develop and select in their business development and market innovation efforts are likely to shape the evaluations and judgments of other market actors. A business model can be used as a device to identify and open up business opportunities for new actors. Acquiring new actors and identifying opportunities can be critical when the services are under development and testing but the future business and markets remain to be explored. Hence, it is important for managers to understand the power of the business model that they create and circulate in the net and the market.

Third, many companies and organizations invest in the development of new technology and technological applications but require tools to develop businesses and connect them with a market. Managers need to understand the nature of markets ‘in the making’ rather than existing markets. Understanding this nature can be all the more important in technology-based service markets, where
traditional market segmentation efforts do not work. Managers need to focus on connecting with other market actors, including partners, research institutions, financers, customers, and users. By using a business model, managers can translate, circulate, and transform the idea of a business into business development activities in the net, that is, share the idea of the potential market for the service offering and what needs to be done to make actualize the market. Hence, managers can use business models as devices to imagine markets that fit the capabilities and knowledge of the firm and to enroll and mobilize other market actors in their market innovation efforts by convincing them with a compelling business model.

Fourth, by understanding business models as frames for action, managers can use business models to diagnose problems (diagnostic frame), identify potential solutions (the prognostic frame), and take the required action (the mobilization frame). Too often business models are used to understand a problem in a way that prevents their use as prognostic in any other way than one, preventing the company from innovating. Therefore, managers need to use business models diagnostically in multiple ways (diagnosing multiple possibilities). To do this, it is important to identify the critical events where the use of the model shifts: from diagnosing a problem related to the business model elements to finding a solution to the problem and motivating others within and outside the organization. Thus, a company can acknowledge the barriers of its business model that limit potential possibilities and identify novel opportunities in the net and the market to be exploited in the business model.

Finally, developing future business is a challenging task for many companies. Managers face decisions about the future every day, and helpful tools are needed. When aiming to market novel technology-based services, managers may find it useful to note two areas in the development work that merit particular attention: business net development and business opportunity development. Managers embarking on research and testing activities should first analyze their current business models and how they may constrain the opportunities that they can exploit. In addition, the business models of the actors involved in the development of new technology-based services influence the development of the net, and vice versa. Next, managers should identify the resources and competencies that are necessary for an effective business model and try to enroll and mobilize actors with such resources. The views and frames of the different actors concerning the service development and related business opportunities may be similar or different, resulting in controversies. Hence, developing a convincing
business model and framing it differently for different actors is critical. In developing such a model, entrepreneurial actors may be essential in establishing the net and the business model itself.

6.4 Evaluation of the research

The most commonly used criteria for evaluating research are reliability and validity. However, these constructs are more appropriate for quantitative studies following a positivist research paradigm (Eriksson & Kovalainen 2008, Patton 2002). The aim of this research was to develop our understanding of a complex and dynamic phenomenon, and therefore, the study aimed for analytical rather than statistical generalizability (Yin 2003). Accordingly, different evaluation criteria are needed.

Terms such as quality, credibility, and trustworthiness have been applied when evaluating qualitative research (Eriksson & Kovalainen 2008, Lincoln & Guba 1985, Miles & Huberman 1994, Patton 2002). A variety of criteria could be applied to evaluate the quality of qualitative research (see e.g., Miles & Huberman 1994, Patton 2002). The chosen evaluation criteria should be compatible with the chosen methodology, aims, and assumptions (Eriksson & Kovalainen 2008). Consistent with constructionism, the trustworthiness criteria suggested by Lincoln and Guba (1985) are applied to evaluate this study. These criteria can also be called the ‘goodness’ criteria for research (Eriksson & Kovalainen 2008: 294). In the following paragraphs, the ways in which the credibility, transferability, dependability, and confirmability of the study were improved during the research process are discussed.

Credibility refers to the degree to which the data and the results are compatible (Eriksson & Kovalainen 2008, Lincoln & Guba 1985). The credibility of the findings was improved by prolonged engagement (Lincoln & Guba 1985): the researcher was involved in the two research projects from the start and thus gained a thorough understanding of the contextual and the empirical settings for the phenomenon. Triangulation, referring to the use of multiple data sources, data collection and analysis methods, theories, and researchers (Patton 2002), was used. Multiple data collection methods (interviews, observation, and Delphi questionnaires) and sources (different actors, experts, and archival data sources) were used throughout the research process. The data analysis consisted of organizing the data in different ways (coding, thematizing) and proceeded to interpreting the data by writing stories and descriptions as well as illustrating the
data in different ways. During the research process and the writing of the individual research papers, discussions with co-researchers and authors took place, improving the analyst triangulation (Patton 2002). In addition, multiple theoretical perspectives were integrated in the study (see Lewis & Grimes 1999) to examine not only business models but also markets, networks, business opportunities, and framing to understand the complex phenomenon. The results of the study, which are presented in Chapter 6.1, are described in detail and the ways in which those results have been achieved are addressed. In answering the research questions, the results drawn from the data of this study are compared to the existing theoretical knowledge and the ways in which this study supports or brings new knowledge to existing theory are elaborated.

Transferability refers to the degree to which the results apply in other contexts, that is, the connection to previous research (Eriksson & Kovalainen 2008). Transferability has also been linked to external validity (Miles & Huberman 1994); however, it should not be confused with replication (Eriksson & Kovalainen 2008). Lincoln and Guba (1985) stress the responsibility of the researcher to provide data to enable others to make transferability judgments. The research design and the data collection processes for the two different research settings are described thoroughly. Moreover, the contextual characteristics are described theoretically (Chapter 2) and empirically in the introductory chapter and in each paper. The connections to previous studies are described in Chapters 6.1 and 6.2, and the limitations of the research are acknowledged.

Dependability refers to the logic, traceability, and documentation of the research process and indicates the trustworthiness of the research (Eriksson & Kovalainen 2008). Miles and Huberman (1994) link dependability and reliability in determining the consistency of the research process over time and across methods. The study has clearly stated the research problem and divided it into two research questions. The theoretical positioning and background are congruent with the research problem, and the methodological choices of the study were made based on the objectives. The data were collected at different stages of the research process, covering past, present, and future perspectives. Two different empirical settings were included, and several different informants were interviewed. Additionally, all the papers have gone through a peer review process.

Confirmability refers to the audit process, which ensures that the findings and interpretations are supported by the data (Lincoln & Guba 1985). Confirmability shows that the data and the interpretations are not ‘imagined’ (Eriksson & Kovalainen 2008). The whole research process, including the data collection and
analysis, is described thoroughly in Chapters 4.3 and 4.4. In addition, the collected empirical data and the data analysis are addressed in greater detail in each research paper. All interview data were transcribed, and interview excerpts are incorporated to show support for the data analysis, allowing others to follow the logic of the research process.

6.5 Limitations and future research avenues

As in all research, there are certain limitations to this study from which we can derive future research suggestions. First, as has been noted throughout the study, research on the business model concept is fragmented, and the concept is complex, with a variety of types and levels of definitions. For a business model framework to be useful, it needs to be reasonably simple, logical, measurable, comprehensive, and operationally meaningful, and it must avoid oversimplifying a firm’s model (Morris et al., 2005). This study has revealed the variation in the concept of business model and its use in business nets and markets. However, the marketing discipline also covers discussions other than networks and markets. Hence, it is acknowledged that the use of business models is limited to these aspects of marketing theory and practice.

Another limitation concerns the specific context of the study: emerging technology-based service markets. The empirical settings of the study were strongly connected to research projects in which companies were engaged in developing new technology-based services. Hence, the results and conclusions mainly address the use of business models for services developed in a research or R&D project. However, the findings of the study can be applicable in other emerging business fields featuring new innovations and rapid change.

Third, a limitation concerns the collection of the empirical data. Although the future time dimension is justified in this specific empirical setting and contributes to future business planning, it also creates some limitations for studying the use of business models. The data collection took place during the development and testing (or piloting) phases of the services and did not follow the whole process of commercialization; rather, the study employed future-oriented interviews and Delphi questionnaires. Such future expectations and views expressed in the data are the subjective interpretations of the managers taking part in the development and testing of the services.

Fourth, there is a limitation to studying the understanding and activities of the market actors and the narratives in developing new technology-based services and
shaping the market for such services. The researcher participated in the research projects and was thus able to observe the efforts of the actors in the projects. In addition, the interviewees were asked to describe their activities and those of others that they encountered while developing and testing the services as well as tell stories of their service development projects. However, it is challenging to capture all the constituent activities or complete narratives but they are subjective interpretations of the interviewees and the researcher.

Finally, it must be acknowledged that factors other than a business model may shape the actions of the companies and their partners in their service development projects. The business model frames that were studied have not been necessarily developed explicitly for the purposes of the companies’ business models but for business in general. Additionally, as the concept of business model is socially constructed as opposed to being a natural reality, and is thus a challenging object to be researched. However, business models provide a useful construct for understanding the complexities of phenomena.

The limitations of the study offer several future research avenues. The commercialization of emerging technology-based services is often problematic, and hence, future business development and market innovation are important areas for further research. Related to observing the future possibilities, a more in-depth exploration of the actors’ sense making and framing would deepen our understanding of how companies plan emerging businesses in networks.

Because empirical studies of business models are scarce, we should focus on the nature of the data to be collected. Follow-up studies on the formation and construction of the networked market provide additional insights into the development and use of business models. Temporality clearly needs to be incorporated into the empirical research on business models in future research. Observing an operating business net and business model development would also be important to advancing our understanding of the phenomenon. The way in which the practices in the development and use of business models can be studied also merits further attention.

More in-depth examination of the narrative nature of business models is clearly needed, as it still being a rather under-researched topic within the business model research. This side of business models merits attention both theoretically and empirically. In addition, the performative power of business models, e.g., in shaping markets, is an important avenue for further research.

Finally, empirical studies on the construction of markets are needed. This study provides insights into the phenomenon of shaping the market by using
business models, but further empirical research is clearly needed to elucidate the complexities of the different devices in constructing a new market.
References


Appendix 1 Delphi questionnaires (stage 1)

The following is a list of questions presented in the Delphi questionnaires (first and second rounds) at the first stage of the research process.

First-round questionnaire on defining business models

1. Some statements/definitions of business models found in earlier literature are presented below. Do you agree? Please comment.
   a) The concept of business model generally describes the key components of a given business: 1) customers, 2) competitors, 3) offering, 4) activities and organization, 5) resources, 6) supply of factor and production inputs, and 7) a longitudinal process component to cover the dynamics of the business model as well as the cognitive and cultural constraints that management has to take into account.
   b) Companies must find the right business model to create value from new technology. The business model provides a framework which considers the technological characteristics and potentials as inputs and converts them through customers and markets into economic outputs.
   c) Business model represents the roles and relations among the firm’s customers, allies, and suppliers identifying the major flows of product, information, and money and the major benefits for the actors.
   d) Business model represents an important locus of innovation and a crucial source of value creation for the firm and its suppliers, partners, and customers. Each business model is centered on a particular firm.
   e) Business model is defined “as a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network”.
   f) Business models of companies must be linked to the business models of the other companies involved in the network.
   g) Three core elements of a network business model can be identified: the product/service, the business actors and their roles, and value-creating exchanges among the actors.
2. How would you change and/or complement these abovementioned definitions?

3. What kinds of elements are important in a business model?

4. Does the concept of business model help in creating business in your business field? How?

The references of the above-presented definitions in alphabetical order are as follows:

Second-round questionnaire on defining business models

1. The following figure has been formed based on your answers to the first questionnaire. The figure describes the possible elements of business models: the service/product, the value net, actors and their roles, value exchanges, the business logic and strategic choices, and the environment. Business models can include all or some of these elements: the value-creating net, its actors and their roles, the value exchanges between the actors, and the service/product that is being developed in the net. The business model should also provide the basis for both operational-level business logic and strategic choices that are connected to each other. All these elements are, however, affected by continuous changes in the surrounding environment (see the arrows), which must be taken into account in developing and executing the business models.

Please comment on the figure and/or individual elements. What would you add/delete/change?
2. Below there are three statements regarding business models and their characteristics. The statements have been made based on your answers given in the first questionnaire. Do you agree or not? Please comment.

   a) It is impossible to develop a general definition for a business model, but it is more realistic to provide a tool for companies to develop their business models.

   b) A business model is a dynamic framework for companies both in long-term and short-term planning and needs to be adapted according to continuous changes in the surrounding environment.

   c) It is necessary to develop a business model for a net of actors who are in close cooperation with each other, e.g., producing a new ubiquitous service together, and each player can specify their own models later.

3. Is there anything else to consider regarding the elements or other characteristics of business models in developing and commercializing technology-based services, e.g., UBI services?
Appendix 2 General interview themes, UBI service pilot (stage 2)

The following is a generic list of interview themes used in the UBI service pilot interviews. However, they were modified to some extent to better suit the different actors based on the interview experience of the researcher.

1. Background information
2. UBI technology
   - Perceptions and views on ubiquitous technology/computing
   - Potential business opportunities
   - Problems
   - Changes in perceptions during involvement in the project
   - Reasons for participating in the project
3. UBI infrastructure
   - Elements of the UBI infrastructure
   - Ideal use of the infrastructure
   - Necessary actors in creating and maintaining such an infrastructure
4. UBI services
   - Potential from the actor’s perspective
   - Necessary actors in the commercialization and production of the service
   - Possible cooperation of the actor in the commercialization and production of the service
   - Potential issues, possibilities, or problems in developing a business model for the service
5. Future expectations
   - UBI services in the future
   - Progress of UBI technology and infrastructure in the future in creating smart urban spaces
   - Ubiquitous city 10 or 20 years from now
   - Development and commercialization of ubiquitous infrastructure and services in the future
Appendix 3 General interview themes, IT service development projects (stage 3)

The following is a generic list of interview themes used in the first set of interviews in the IT service development projects.

1. Background information
2. The present status of service business in the organization
   - Meaning and extent
   - History
   - Objectives
   - Development of current and future services
3. A story of a successful or failed service development
4. The future of service business
   - Characteristics and requirements for forerunning in service business
   - Development of service business
Appendix 4 General interview themes, IT service development projects (stage 4)

The following is a generic list of interview themes used in the second set of interviews in the IT service development projects.

1. Background information
2. Service development project
3. Involvement of the customer/service provider in the project
4. Cooperation in the service development
5. Successful events/issues in the service development
6. Benefits of the cooperation in the service development
7. Challenges of the cooperation in the service development
8. Changes in the actions of the actor in cooperating in the service development
9. Roles and tasks in the service development
Appendix 5 Delphi questionnaires (stage 4)

The following is a list of generic themes on which service-specific statements and questions of the year 2016 were presented in both Delphi questionnaires (first and second rounds) at the fourth stage of the research process.

1. Business environment and market
2. Service under development
3. Customer
4. Network
5. Resources, activities, and competencies
6. Revenue logic
7. Other possible changes in the market by 2016
Original papers


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50. Pyykkö, Elna (2010) Stock market response to research and development expenditures of the firm in the context of mergers and acquisitions
52. Ainali, Saara (2011) Alueiden työllisyyden rakenteen ja kehityksen tavaratoiminnan ja palvelujen vuorovaikutuksesta
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