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Collaborative learning with users as an enabler of service innovation

Katri Kallio

VTT

VTT SCIENCE 110

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Katri Kallio

A doctoral dissertation for the degree of Doctor of Science in Technology to be presented with due permission for public examination and criticism in TUAS building in Lecture Hall AS1, at Aalto University School of Science (Espoo, Finland), on the 13th of November 2015 at 12 noon.

ISBN 978-951-38-8350-8 (Soft back ed.)
ISBN 978-951-38-8351-5 (URL: http://www.vttresearch.com/impact/publications)

VTT Science 110

ISSN-L 2242-119X
ISSN 2242-119X (Print)
ISSN 2242-1203 (Online)
http://urn.fi/URN:ISBN:978-951-38-8351-5

JULKAISIJA – UTGIVARE – PUBLISHER

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Cover image: Kirsti Kaila

Juvenes Print, Tampere 2015

Preface

"*If we take it seriously that knowledge is the most fundamental resource in our contemporary economy and that learning is therefore the most important process, what are the implications…?"* (Lundvall and Johnson, 1994, p. 23)

My personal motivation to study the phenomenon of how learning with users could enable service innovation has been driven by a long lasting interest to understand these processes both in practice and theory. The first practical spark that inspired me to explore this topic was when I was an undergraduate student in the Turku School of Economics. In summertime, I moved from the world of academia to work in professional service organizations and suddenly I noticed that this attracted my researcher 'instincts'.

Particularly important was the period of working in an organization that was undergoing a renewal. I found myself pondering how the renewal could be organized in a way that would best utilize the creativeness of skilled employees and their understanding regarding users. I remember sitting in a personnel meeting for approximately 150 people and noticing that only a few employees, the most courageous ones, dared to present their ideas and opinions for the future when the management asked. Yet, after the meeting, in coffee rooms and breaks, I noticed the 'real ideation' taking place. Based on their user interaction, employees expressed views that differed from those of managers.

I wondered why it was so. Why did people not participate in the discussion when such an occasion was arranged and why did the dialog with the management seem insufficient? Where did the motives or sources of the renewal actually originate and who were supposed to be its implementing actors? I pondered whether renewal situations in these kinds of organizations could be occasions of conscious, collaborative development; occasions where employees' and users' ideas would be truly utilized.

The topic intrigued me to the extent that I carried out my Bachelor's thesis on it. From the organizational learning literature, I found first explanations on how to organize the change and development of novelties in a collaborative manner. I proceeded to my Master's thesis and got an opportunity to join the innovation research group at VTT Technical Research Centre of Finland. Together with my colleagues, I had the chance to be involved in a 'real life' experiment based on organizational

learning theory, aiming at the development of innovation endeavors. I studied the findings of the experiment. As a result, both my Master's thesis and my first academic co-publication utilized in this thesis were published. My journey as a researcher had started.

For this PhD thesis, I have collected the conceptual understanding and research results created in four (I–IV) scientific articles published in 2010–2014. These articles have been carried out in the context of knowledge-intensive service organizations where I, together with my colleagues, have studied their collaborative learning attempts aiming at innovation with users. The studied organizations are professional in their nature and operate in both public and private service sectors in Finland, most of them are also involved in international collaboration.

Acknowledgements

If there is one thing I have learned during the course of my PhD work, it is the importance of collaborative learning. During this journey I have grown both professionally and personally more than I could have imagined. What I have learned is that with a curious mind, determination and hard work, a person can fulfill her dreams. However, these dreams are not realized alone. They are collaboratively created with the people around you. I would like to thank sincerely the people who have supported, inspired and collaboratively created this journey with me.

First, I would like to thank my official and mental instructors to whom I owe my deepest gratitude. Professor Eila Järvenpää from Aalto University has worked as my thesis supervisor. I'm extremely thankful to you Eila for your time and dedication to this project. The discussions we have had during this journey have been very important to me. In the moments of doubt, they gave me the belief to carry on, and in the moments of refinement, they provided me the needed punctuality.

Research Professor Marja Toivonen from VTT has worked as my thesis advisor. Marja is one of the leading academics in service innovation. Marja's passion, knowledge and skills are unique. For me, it has been a huge privilege to have the chance to learn from Marja. I would like to thank sincerely you Marja for your time, dedication and guidance during this journey. Your caring and educating approach have been invaluable important to me. You enabled me to finalize this thesis and the things I have learned from you reach way beyond. You have my deep respect and gratitude.

Professor John Parm Ulhøi and Associate Professor Per Kristensson have been the pre-examiners of this thesis. I would like to thank you both for reading carefully my proposal and providing insightful and encouraging comments. I would also like to thank my opponent, Associate Professor Flemming Sørensen for familiarizing with the thesis and discussing it at the public defense. I highly appreciate your thoughts, guidance and research.

I would also like to thank sincerely my mental muse, Dr. Eveliina Saari, who has guided and inspired me since my first academic days at VTT. We share similar interests with Eveliina and whenever I have been losing the track, one single discussion with her has put me back into it. Eveliina guided my Master's thesis and first academic co-publications. She has provided me the lenses needed to design a study and see the value of empirical data. The specialty of our relationship can be reflected through the poem Eveliina read to me at my Master's thesis graduation

dinner. It was about her dream. In her dream, she had given birth to a child. She was puzzled. In the morning, she had realized what the dream meant. A new researcher had been born! I would like Eveliina you to remember that it was you, who gave birth to that researcher. To show my gratitude, I'll do what you have thought me to do. I'll pass the example on to younger colleagues.

Second, I have been very fortunate to work with many knowledgeable academics and practitioners nationally and internationally. Nationally, I wish to thank deeply my co-authors, colleagues and manager at VTT and from other collaborating research institutes. My co-authors Eveliina Saari, Minna Halonen, Inka Lappalainen and Karo Tammela, the collaboration with you has been fruitful and extremely valuable. Together we learned the practices of academic research, visited multiple conferences and explored the research problems in practice. Huge thanks and a big part of this thesis belong to you.

I would also like to thank my other inspiring co-workers at VTT. Kirsi Hyytinen, Hannamaija Määttä, Arto Wallin, Kaisa Koskela-Huotari, Pasi Pussinen, Dr. Marja Harjumaa, Dr. Kaisa Still and Dr. Mari Ervasti, discussions with you have always been clarifying and opened new perspectives to look at phenomena. Dr. Heli Talja, Dr. Maaria Nuutinen, Dr. Peter Ylén and Tiina Valjakka, thank you for being such supportive and understanding leaders. Also, Prof. Pentti Vähä and Dr. Matti Kokkala, your support and visionary actions at VTT's service research have been invaluable. Without you, this thesis wouldn't most probably exist.

I'm grateful also to my colleagues from other research institutes in Finland. Dr. Mervi Hasu, your work has been a pioneer and a source of inspiration to me. Dr. Laura Honkaniemi, Dr. Tiina Tuominen, Mikko Lehtonen, Dr. Pirjo Korvela, Essi Kuure, Antti Lindström and Prof. Minna Isomursu, collaboration with you has been inspiring and provided important viewpoints to consider. Sari Tarvonen and Petri Kalliokoski, I would also like to thank you for the mentoring and your belief in me.

Internationally, conferences and visiting periods have been important occasions to learn academic insights and grow as a person. I would like to thank my colleagues from USA and Italy: Dr. Jim Spohrer, Prof. Stephen Kwan, Dr. Louis E. Freund, Dr. Elena Luppi, Dr. Tiziana RussoSpena, Prof. Cristina Mele, Dr. Marco Tregua and Dr. Claudia Casbarra. Thank you all for the thoughtful discussions and your hospitality.

Third, the research of the articles compiled in this thesis took place in different national research projects. I wish to thank the financiers and partnering organizations of those projects: VTT, Tekes, Ministries and research institutes in Finland. I address special thanks to TSR – the Finnish Work Environment Fund – and the Foundation for Economic Education for enabling to finalize the thesis. Furthermore, I would like to thank those managers and employees of the studied case organizations who invited us to join to their activities and gave us their time for the interviews. Without you, the empirical research of this thesis would not exist.

Fourth, for the personal support I wish to thank my friends and family. You have provided me the needed balance in life during this long-lasting and tough journey. I'm grateful to Kirsi Niemi and Susanna Pirttikangas from our daily discussions. Thank you also Sari and Jani, Reetta and Tapio, Heli and Tuomo, Teppo and Satu, Tuire and Tapani, Kate and Jaakko, Tiina, Aleksi, Jonna, Johanna, Ansku, Maija,

Laura, Outi, Bitte, Paula, Tuija, Sirpa, Maikku, Samu and Anni, Jussi and Katja, Henri and Teija-Leena, Katriina and Oulu-Aleksi, Maikki and Matias. I appreciate your friendship, and I'm sorry for neglecting many of the social events while working with this project. However, knowing that you are there, in a phone call away, has given me the reassurance needed.

My family, mom, dad and sister, I'm grateful to have you in my life. You have shown me the example in life and encouraged me to go on with my studies. You have encouraged me to explore the world, travel and obtain a variety of perspectives. Most importantly, you have always believed in me. Thank you for your endless love and support. Thank you also for your support and encouragement during this project Pauli, Hilkka, Erik, Nella, Aku, Ukko and Aino.

Finally, Nisse and Nero, my partners in life. Both of you have provided me your unconditional love and support during this journey. Thank you for always believing in me and supporting me in what I do. Nisse, you have made me believe in myself and become more independent. You have given me the time, space, support, friendship and love needed for finalizing this thesis. For those I'll stay forever grateful.

I dedicate this work to all of you who have supported, inspired and collaboratively created this journey with me.

Oulu, 1st of October, 2015

Katri Kallio

Academic dissertation

Supervising Professor	Eila Järvenpää Aalto University School of Science, Finland
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List of publications and contributions of the authors

This thesis is based on the following original publications which are referred to in the text as Articles I–IV. The publications are reproduced with kind permission from the publishers.

Article I

Halonen Minna, Kallio Katri & Saari Eveliina (2010) Towards co-creation of service research projects: A method for learning in networks. *International Journal of Quality and Service Sciences*, Vol. 2, No. 1, pp. 128–145.

The authors are in alphabetic order since the contribution is equal. The author of this thesis had the main responsibility for the empirical analysis of the article. The method presented was co-developed by the authors based on the method described by Eveliina Saari and Katri Kallio (Article II) and on the foresight competence of Minna Halonen. The earlier version of the article was co-presented in the 2009 Naples Forum on Service, June 16–19, Capri, Italy.

Article II

Saari Eveliina & Kallio Katri (2011) Developmental impact evaluation for facilitating learning in innovation networks. *American Journal of Evaluation*, Vol. 32, No. 2, pp. 227–245.

The author of this thesis had the main responsibility for collecting and analyzing the empirical material. She also participated in planning and writing the entire article. The authors co-presented the earlier version of the article in the International Conference on Organizational Learning, Knowledge and Capabilities (OLKC), April 28–30, 2008, Copenhagen, Denmark.

Article III

Kallio Katri & Lappalainen Inka (2014) Learning about service-orientation in KIBS: Understanding the customer as an active actor. *Service Science*, Vol. 6 No. 2, pp. 78–91.

The author of this thesis had the main responsibility for the article: its theoretical framework, empirical results and discussion. The analysis frame to combine S-D logic and the expansive learning theory was built by the co-author. The author of this thesis took the main responsibility for the revision of the article based on the scientific feedback of her supervisors and anonymous reviewers of Service Science. She presented the article in the 2nd International Conference on The Human Side of Service Engineering, July 19–23, 2014, Kraków, Poland.

Article IV

Kallio Katri, Lappalainen Inka & Tammela Karo (2013) Co-innovating in public services: Planning or experimenting with users? *The Innovation Journal: The Public Sector Innovation Journal*, Vol. 18 No. 3, pp. 1–16.

The author of this thesis had the main responsibility for the article: she was responsible for carrying out the theoretical analyses and revision of the article based on the comments by the reviewers of The Innovation Journal: The Public Sector Innovation Journal. The empirical analysis and conclusions were done in tight collaboration by the co-authors. The author of this thesis presented the earlier version of the paper in AMA SERVSIG conference June 7–9, 2012, Helsinki, Finland.

Contents

1. Introduction

1.1 Motivation and context

Today's economies have two fundamental characteristics. First, they are *service economies* where more than 70 per cent of the jobs and GDP are accounted directly by services (Gallouj and Djellal, 2010; Oliveira and von Hippel, 2011). In these economies, technological systems and industrial products are often also understood as service solutions or they are considered to include services, depending on the viewpoint (Brady et al., 2005; Brax and Jonsson, 2009; Windahl et al., 2004). Importantly, the offering of services and the overall service-orientation bring *users*[1] *to the center* of business activity. Users play a significant role in the production of services, the creation of value, and development of novelties (Edvardsson et al., 2010; Vargo and Lusch; 2004; 2008). This view applies increasingly to all industries, knowledge-intensive sectors being one of the important application areas. An illustrative example is applied research, where researchers do not concentrate solely on scientific facts based on certain premises but increasingly solve topical problems of users and collaboratively develop service solutions that have an impact on the user's business and on society (Nowotny et al., 2001; Van de Ven, 2000).

Traditionally users have been seen as the targets of the service providers' activities and not considered as active actors in innovation, neither initiators nor the agents of change (Sundbo, 2000). This attitude has been especially typical in public services (Langergaard, 2011). However, it is not a sustainable strategy in

[1] In this thesis, customers are referred to with the term 'user'. This is because of two reasons. The first one is simplicity: 'user' refers both to the immediate beneficiary and to the final beneficiary. This enables the examination of a chain or network of actors, and the term 'user' can be interpreted as either a person or an organization who or which actually or potentially benefits from a service through receiving it or through participating more or less actively in its production and development' (Sundbo and Toivonen, 2011, pp. 6–7). In the empirical research of the thesis, all kinds of the above-mentioned actors were involved. Second, the term 'user' is more neutral than the terms 'customer' or 'client', typically applied in the private sector, or 'citizen', typically applied in the public services (Lehtonen and Tuominen, 2011). Moreover, a strict division between the above mentioned roles is not easy or sometimes even inappropriate because the same people may represent different roles depending on the situation.

the conditions where many countries (including Finland – the country of this research) suffer from problems in economic growth and their competitiveness is at stake. The population is aging and the dependency ratios deteriorating. In the future, all services, both private and public, need to be produced increasingly skillfully and effectively in an environment where the competitiveness is evaluated in global markets (Miozzo and Miles, 2002). All resources available need to be utilized and the responsibility for service production and development has to be placed partially on the users. Hence, it is topical to understand *how the creative potential of users can be fostered in providing valuable inputs to the service organizations* in equal and interactive relationships.

The second characteristic of the today's economies is *knowledge*; the competiveness and renewal of these economies depends on learning and innovation capability (Lemola, 2002; Lundvall and Johnson, 1994; Lundvall et al., 2002). Management scholars have identified *innovation capability* as the most important determinant of organizational performance (Mone et al., 1998). It refers to the organization's ability to innovate and organize its innovation processes effectively (Crossan and Apaydin, 2010; Sundbo, 2000). Researchers have argued that a growth strategy based on innovations increases competitiveness and makes it possible to foster employment and welfare on a larger scale (Lundvall et al., 2002). Actions supporting innovations have also been emphasized in the public service development. It has been considered important to be aware of, to make visible (i.e. to describe and structure), and to foster both the top-down and bottom-up initiatives aiming at innovations (Albury, 2005; Hartley, 2005).

Previously it was thought that only a few service organizations innovate, and if they do, they produce only minor changes with little relevance for the economic growth (Gallouj and Djellal, 2010). The majority of empirical studies on innovation were conducted in the context of manufacturing and product development. This meant that also the innovation activities in the context of knowledge-intensive service organizations were neglected (Sundbo, 2000). Nowadays, the earlier views have been questioned. Several studies have indicated that knowledge-intensive service organizations, such as information technology (IT) and consultancy firms, are among the most active innovators in the entire economy and resemble high-tech manufacturing companies in their propensity to innovate (Miles et al., 1995; Lemola, 2009; CIS, 2012). Much of the innovation and growth potential of developed countries has been recognized to belong to the knowledge-intensive service fields.

In this thesis, private and public *knowledge-intensive service organizations and their innovation activities with users* are the focus of interest. 'Innovation activities' refer to those activities in organizations that are directed for the development, implementation, adaptation, and spread of innovations (Hurley et al., 2005). 'Innovation activities' is a broader concept than 'innovation processes' because it covers – not just the creation of novelties – but also the adoption of innovations developed outside the organization (Tuominen, 2013).

The term 'knowledge-intensive service organization' is close to the concepts of 'knowledge-intensive firm (KIF)' and 'knowledge-intensive business services

(KIBS)'. The former concept was introduced by Starbuck (1992) and refers both to knowledge-intensive manufacturing firms and to knowledge-intensive service firms. However, the basic definition included is important from the viewpoint of this thesis. It points out three characteristics, in particular. Knowledge is a stock of expertise, not a flow of information. Knowledge-intensity refers to esoteric – exceptional and valuable – expertise instead of widely shared knowledge. Knowledge may not be in individual persons, but it can also be found in the routines and cultures of an organization. Miles et al. (1995) have further specified 'knowledge-intensity' in the service context using the concept of KIBS. According to them, KIBS are private companies that rely heavily on professional knowledge. They provide intermediate, knowledge-based services to other companies and organizations. Compared to the concept of Miles et al. (ibid.), this thesis has a broader scope: it also covers public organizations. An important sub-group is research organizations, which play a central role in creating and distributing knowledge in the national innovation system (den Hertog and Bilderbeek, 2000).

Also the concept of professional service organization (PSF) is near to the above-mentioned concepts. The main difference between these concepts is the target of analysis: the concept of PSF refers to the dominance of specific expert occupations in an organization, whereas the concept of knowledge-intensity emphasizes the nature of activities and the nature of offerings of an organization (Kärreman and Alvesson, 2004; Løwendahl et al., 2001).

For a long time, the expertise acquired by employees during their professional education has been seen as the main source of the benefit that knowledge-intensive service organizations offer to their users. The benefit has also been considered to be a result of individual and autonomous activity of experts (Alvesson, 2004). Nowadays, it has been noticed that a key success factor behind many important inventions in these organizations is the real life necessity of solving users' problems. Solutions need to be 'user intelligent': to be created rapidly and experimentally together with the users (Engeström, 2004; Payne et al., 2008). This highlights the collaboration taking place along the service process and in the development of novel services (Miles, 2005; Silvestro et al., 1992; Sundbo and Toivonen, 2011; Van de Ven, 2000).

In order to emphasize the importance of collaboration phenomena, researchers with different disciplinary backgrounds have adopted numerous 'co-concepts', such as co-creation, co-production, co-design, and co-innovation. These concepts are often used interchangeably, but actually they have different meanings and different origins (Koskela-Huotari et al., 2013; Mattelmäki and Sleeswijk Visser, 2011). In the following, each of them is opened up briefly.

The concept of 'co-creation' was introduced in service marketing literature by Prahalad and Ramaswamy (2000; 2004). The concept refers to a joint value creation by the organization and its users. The co-creation of value is seen as unique due to the users' life contexts and aims. Later on, other scholars (e.g. Vargo and Lusch, 2004; 2008; Vargo and Akaka, 2009) have highlighted the difference between the concepts of 'co-creation' and 'co-production'. By 'co-production' Vargo and Lusch (2004; 2008) refer to the concrete interaction during the service deliv-

ery (cf. also Sundbo and Gallouj, 2000), whereas 'co-creation' refers to a broader and always actor-determined value creation process. In other words, user involvement is optional in co-production, but from the value perspective co-creation is unavoidable (Vargo, 2008; Vargo and Akaka, 2009; also Koskela-Huotari et al., 2013).

In design-driven studies (Saco and Goncalves, 2008; Sanders and Stappers 2008; Mattelmäki and Sleeswijk Visser, 2011), both 'co-creation' and 'co-design' refer to processes aimed at creating something new (idea, service, or product). In these studies, some understand 'co-creation' as an overall creative mindset and 'co-design' as specific events in the creative process (Koskela-Huotari et al., 2013; Sanders and Stappers 2008). In service innovation studies, the concept of 'co-innovation' is used to refer to the collaborative process that aims at creating a novel service or practice with different beneficiaries in and outside organizational borders (Russo-Spena and Mele, 2012; Toivonen, 2010).

This thesis applies the definition of Vargo and Lusch (2006; 2008) as regards the concept of 'co-creation', i.e. the concept is connected to the value perspective. The concept 'co-development' refers to the overall creative process of collaborative development (Edvardsson et al., 2010) which may or may not result in an innovation. The concept 'co-innovation' points out the processes aimed specifically at creating service innovations (Russo-Spena and Mele, 2012; Toivonen, 2010).

Overall, the emphasis in this thesis is that the task of service professionals is – not just to transfer knowledge to the recipient – but to collaboratively solve the topical problems of the users and to support their value creation (Bessant and Rush, 1995; Vargo, 2008). Users can be valuable idea sources and actors in the development of new or improved services which benefit the provider (Blazevic and Lievens, 2008; Sundbo and Toivonen, 2011). However, in order to make this happen, the professionals have to learn to understand the users' contexts, business aims and value networks; to perceive the problems and possibilities from their point of view; and to involve them in the innovation activity systematically (Hirvonen and Helander, 2001; Sundbo, 2000; Sørensen et al., 2013; Toivonen et al., 2008).

This thesis uses the recent studies that describe service innovation processes as complex and uncertain, with a focus on iterative learning and ideas created at grassroots level, i.e. in local contexts with users (Ellström, 2010; Gottfridsson, 2010; 2012; Matthing et al., 2004; Orlikowski, 2002; Payne et al., 2008). The increased importance of dialog highlights that innovation activities in knowledge-intensive service organizations are based on the balance between the strategic and professional interests on the one hand, and the ability to collaboratively learn and develop with users on the other (Hasu et al., 2011; Van de Ven, 2000; Sundbo, 2000). Hence, the focus should be moved from output and provider-centered processes towards better understanding the socially constructed phenomena among multiple actors (Ballantyne and Varey, 2006; 2008; Edvardsson and Tronvoll, 2013). In knowledge-intensive service organizations, this means recognizing and utilizing both internal and external sources of innovation (balancing between user orientation and R&D interests) and organizing the innovation

activity together with users as systematic and efficient collaborative learning processes (Crossan and Apaydin, 2010; Sundbo, 2000).

1.2 Aim of the thesis

The aim of this thesis is a comprehensive discussion about: *how can learning with users take place in innovation activities of knowledge-intensive service organizations as practical and strategy-based activity?* The term 'strategy-based' highlights the link of innovation activities to the strategic aims of the organization. It does not refer to the generation of a strategy in a specific strategy process, but to the strategic aims that direct and channel innovation activity (Sundbo and Fuglsang, 2002). This learning challenge is divided into three sub-topics: 1) how to learn to identify and support the value creation processes of users, 2) how to learn to utilize the potential of users for the development of novelties, and 3) how to learn to organize innovation activity as collaborative learning processes and link it to the strategic aims of the provider? The social processes which can result in an innovation are emphasized, rather than the innovative outcome itself.

The aim of this study derives from the above-described importance of collaborative learning with users in service innovation (Crossan and Apaydin, 2010; Sundbo, 2000), and from the need to develop further the linkages between innovation and learning. Organizational learning scholars (Engeström, 1987; 2004; 2007; Hasu, 2001; Miettinen, 2002) have pointed out that the use of learning concepts in innovation studies has often remained at a rather general level. The importance of learning has been highlighted (Lundvall, 1992; Lundvall and Johnson, 1994) but the concept has not been problematized and the learning mechanisms included have not been described. This means that the theoretical background of learning is not opened up, or it is presented in general terms.

The close linkage of the general innovation literature to macro-economic studies is a possible reason for the emphasis on learning without a detailed elaboration (Lemola, 2002; Lundvall et al., 2002; Lundvall, 2007). These studies have often focused on formal learning mechanisms (such as education and training programs). Some innovation researchers have noticed the central role of learning in producer-user relationships and the nature of learning as informal, social, and collaborative processes (Lundvall, 1992; Lundvall and Johnson, 1994). However, even in these studies the main focus has been on the national systems of innovation. Thus, there remains a need for more in depth analysis to provide understanding about the triggers, conditions, mechanisms and forms of learning within and between organizations (Ellström, 2010; Hasu, 2001; Miettinen, 2002). In other words, studies which focus on questions of how learning takes place with users in the practical innovation activities, and how it could be enhanced purposefully and strategically in organizations, are a necessary perspective. It is also topical to understand how to rapidly and systematically learn with users.

The studies on *user-based innovation and service innovation* come close to the issues of learning (cf. Ballantyne and Varey, 2008; Sundbo, 2000). These studies

include the issues of innovative behavior (Tuominen and Toivonen, 2011) and the outcomes of service innovation (Toivonen and Tuominen, 2009), for example. Originally, the studies on user-involvement in the practical processes of innovation focused on product innovation, but have recently extended to service innovation as well (Sundbo and Toivonen, 2011). However, both product and service innovation studies would benefit from better understanding at the micro-level *what, how, and with whom people are learning at work so that user-based innovations emerge* (Miettinen, 2000; 2002). There exists learning theories applying this approach: aiming to explain the conditions and mechanisms of collaborative learning that contribute to innovation. This thesis applies *the theory of expansive learning* developed by Engeström (1987; 2004; 2007). It describes the learning process as a reorganization of the whole work activity in order to reach an expanded object of activity and better quality in the outcome. A new activity that meets the shortcomings in practice (expansive learning) requires understanding the cultural-historical context of the activity and perceiving its contradictions. This kind of learning takes place in a cyclical manner with multiple overlapping phases of questioning the past activity and of experimenting the new one (Engeström, 1987).

In this thesis, the theory of expansive learning is used to understand in detail the learning processes for service innovation. The thesis also follows the approach of those scholars who suggest that more comprehensive conceptual learning models are needed to trigger innovation (Crossan et al., 1999; Zollo and Winter, 2002). A particular challenge is that these models should consider learning as a strategic issue (Crossan and Berdrow, 2003) and as an interaction with users in practice (Greer and Lei, 2012; Sørensen et al., 2013). This thesis aims to contribute to this discussion by tightening the link between service innovation and organizational learning studies. It focuses on the ways in which collaboration – with users in particular – takes place and strengthens in innovation practice, and on the ways in which mutual learning can be fostered. It aims at creating an empirically verified *model of learning – 'how to learn' with users*. The purpose of this model is to summarize how to create, implement and adapt service innovations with users in knowledge-intensive service organizations.

The model is based on four Articles (I–IV) published during 2010–2014. The articles include four case studies (one of them further includes four 'sub-cases') conducted in knowledge-intensive service organizations, or in their development departments. They include discussions about collaborative learning mechanisms, models, and conceptual tools that enable the *involvement of users as 'voice' or as 'active agents' in service innovation.* The term 'voice of the user' refers to the users' expectations, preferences, and needs expressed by them in their own language and as their own priorities (Griffin and Hauser, 1993). This voice can be captured by listening to users. The term 'agency' refers to the capacity or actions of an actor that actually 'causes events to happen' (Virkkunen, 2006, p. 63; see also Emisbayer and Mishe, 1998). In this thesis, a more specific term 'transformative agency' is particularly useful and refers to 'breaking away from the given frame of action and taking the initiative to transform it' (Virkkunen, 2006, p. 49). Transformative agency is the basis for the view on 'active agents'. It is important in

the case of innovation as it goes beyond the individual here-and-now actions and includes collective change efforts to search for new possibilities (Haapasaari et al., 2014).

1.3 Positioning and the structure of the thesis

There are two research streams that have recently contributed to novel and collaborative views on innovation with users. These are service innovation research (e.g. Calborg et al., 2014; Edvardsson et al., 2010; Gallouj and Djellal, 2010; Sundbo and Toivonen, 2011) and organizational learning research (e.g. Crossan et al., 1999; Crossan and Apaydin, 2010; Ellström, 2010; Engeström, 2004; 2007; Gherardi, 2000). As mentioned above, they aim to describe deeply the complex mechanisms triggering service innovations. Both research streams pursue the understanding of the target phenomenon with a specific conceptual and methodological approach (Matthing et al., 2004) but a link between them is only emerging.

This thesis strives for strengthening the link between service innovation studies and organizational learning studies; it is positioned on their borderline via four perspectives. 1) The first perspective focuses on the collaborative innovation processes with users and includes innovation theories as the background (including theories on service innovation). 2) In the second perspective, expansive learning forms the core, and the background consists of theories of organizational learning. 3) The third perspective analyzes learning as a strategy-based issue and brings to the fore the topic of strategic management. Within this vast topic, foresight and evaluation are considered to be particularly close to the interest of this research and offer frameworks and conceptual tools to tackle the matter. 4) The fourth perspective concerns the empirical context – knowledge-intensive organizations as service innovators. This perspective relies on service theories discussing the specificities of knowledge-intensive service organizations. The combination of the perspectives, their background, and the research interest of this thesis are demonstrated in Figure 1.

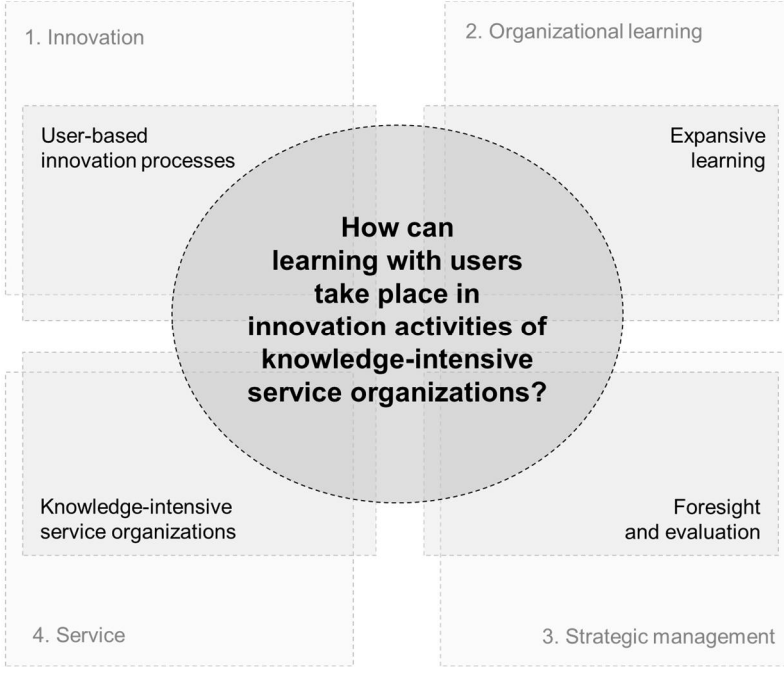

Figure 1. The theoretical perspectives, positioning, and the research interest of the thesis.

The theoretical perspectives described in Figure 1 create the framework of the thesis. The focus and components of the framework can be described as follows. The first perspective opens the discussions regarding the phenomenon of service innovation and the processes of collaboration with users (Alam, 2002; Alam and Perry, 2002; Gottfridsson, 2010; 2012; Sundbo and Toivonen, 2011; Sundbo and Fuglsang, 2002; Sørensen et al., 2013). The second perspective comprises the diverse body of organizational learning literature (Crossan et al., 1999; Gherardi, 2000). It focuses on those learning theories that do not describe continuous developmental activity only, but are interested in discontinuous renewal steps and their emergence mechanisms with the help of learning interventions (Dewey, 1910; Ellström, 2010; Engeström, 1987). These studies have their background in activity-theory, developmental work research, and pragmatism (Dewey, 1910; Engeström, 2004; 2007; Miettinen, 2000). The third perspective includes the frameworks and conceptual tools of foresight and evaluation. In this thesis, these frameworks and tools are linked to the triggering of learning as a strategy-based innovation activity and to perceiving the object of work as part of societally relevant questions and the user's activity (Ahlqvist et al., 2012a; Bell, 2003; Patton, 1997; 2011). The fourth perspective on knowledge-intensive service organizations forms the context of the study. Their characteristics have been partially discussed

above and this discussion will be supplemented in the description of the empirical research.

In order to keep the analysis coherent, there are some restrictions in the literature included. Cognitive studies on learning have not been discussed. This is because the interest is in the collaboration within and between organizations and their users: in activity. The general, vast literatures on strategic management are referred to only when they have a direct link to the topic of user collaboration in service innovation. The macro-economic studies with different quantitative models are not examined but the societal, 'macro-perspective' is included in three ways. First, the research interest concerns societally topical questions in private and public service sectors. Second, societal issues are present in the development of service innovation theories. Third, the relationship of an organization with its environment and users is important as it often creates the motive for learning and the need for change (Engeström, 1987; cf. Sundbo and Fuglsang, 2002).

Altogether, this thesis consists of the summary part and four articles. Each of the articles has an own theme and corresponding theoretical literature. The selection of the literature was 'qualitative'. It means that in each theme area classical and most recent articles were included. The literature was searched from the most important journals. Together, the themes and the literature, create the theoretical discussion of the summary part. One theoretical discussion, which is not included in the articles, is added to the summary. It connects the discussions about strategic orientation and user-based service innovation together. The discussion is about organizational conditions for service encounter-based innovation (Sørensen et al., 2013).

The structure of the summary part is the following. After this introduction, Chapter 2 deals with the research framework (Figure 1) and ends up with a summarizing sub-chapter where the research gaps are presented. Chapter 3 includes the research questions, the approach, the case context, and the methods of the study. The methodology of the thesis is qualitative and case studies are carried out with an action research approach. The empirical material is based on observations and interventions concerning innovation activities; theme-based interviews of the key persons involved supplement the material and focus on the processes and results of innovation. The empirical research context concerns both organizations whose main activity is knowledge-intensive service and organizations that have knowledge-intensive service departments. The case organizations representing the former type are publicly funded research organizations and a private IT company. The case organizations representing the latter type are development departments of cities.

The empirical results from the four Articles (I–IV) are summarized in Chapter 4. The results of the studies are placed on the expansive learning cycle (Engeström, 1987) in order to illustrate how learning with users takes place in different types of innovation activities. More specifically, the first two Articles (I and II) deal with the issue of how knowledge professionals learn from users when exploring and exploiting the provider organization's strategy-based activity. The focus is on the managements' and professionals' learning efforts when they involve the 'voice' of

users in perceiving the future change needs and in evaluating the past activity in order to develop new concepts of activity. In the last two Articles (III and IV), the examination concerns the issue of how the role of users as 'active agents' can be promoted in creating and testing service innovations in practice – an issue close to the 'transformative agency'. Chapter 5 includes the discussion and conclusions. It points outs theoretical and managerial implications, evaluates the research, and provides some suggestions for further studies.

2. Main theoretical perspectives

2.1 Growing importance of service innovation

Innovation is as old or even an older phenomenon than business activity itself: as long as there has been exchange, there has been the need to differentiate and survive among the competition (Lemola, 2002; 2009). This might also explain why the theories of innovation comprise so vast and heterogeneous a field and why they are addressed in and between multiple disciplines, such as economics, management, marketing, and the sociology of technology (Crossan and Apaydin, 2010).

In innovation studies, there has been a persistent view suggesting that innovations and their creation are mainly driven by technological opportunities, linear in-house efforts, and the provider push (Gallouj and Djellal, 2010; Lemola, 2002; 2009). For several decades, the concept of innovation was operationalized as the R&D intensity or as the number of patents (Crossan and Apaydin, 2010). However, it is increasingly understood that societal problems, service needs and user preferences often work as the main driver (pull) for innovations (Lundvall, 1992; Toivonen and Tuominen, 2009).

Lehenkari (2006) notes that in a broad sense social science research on innovation could be labeled as 'innovation studies'. The oldest and deepest root for the development of innovation studies drills down to economic and macro-economic studies (Lundvall, 2007). Joseph Schumpeter is 'the father' of these studies. He defined innovation rather broadly: as the introduction of a new good or a new quality of a good, the introduction of a new method of production (including a new way of handling a commodity commercially), the opening of a new market, the conquest of a new source of supply of raw material or intermediate input, and the establishment of a new organization (Schumpeter, 1934, p. 66). Schumpeter stressed the novelty aspect and considered new combinations of existing things as a general form of innovation. He developed the idea that innovations emerge in everyday activity and entrepreneurs are the key actors behind innovation (Schumpeter, 1942).

After Schumpeter, the focus in innovation studies narrowed down to technological innovations. These innovations were seen to emerge as the result of systematic pre-planned R&D efforts in-house departments (Howells, 2004). In the late

1980s, this view was questioned and the pioneers of the broad view on innovation (Kline and Rosenberg, 1986) emphasized that innovations are not solely technological inventions or created by single heroic acts. So-called 'innovation systems thinking' gained ground (Lundvall, 2007). This thinking was applied at the level of nations, regions and sectors. Parallel with the broad perspective, collaborative learning and everyday activity were placed at the center of innovation. Learning was emphasized as a social and collective process that could be understood in its institutional and cultural contexts (Lemola, 2002; Lundvall, 1992; Lundvall and Johnson, 1994; Schienstock, 1999). Instead of solely focusing on R&D efforts, the importance of interaction between the producers and users – learning-by-interacting and learning by-doing (cf. Jensen et al., 2007) – was pointed out as a prerequisite for fostering the emergence of innovations.

In service innovation studies, the views of the above-mentioned scholars have influenced particularly the evolutionary economics branch (Gallouj and Djellal, 2010). Within this branch, both theoretical and empirical studies have been carried out (e.g. Rubalcaba et al., 2012). However, empirical studies that would open up and describe the actual process and dynamics of learning with users are rare (Hasu et al., 2011; 2015; Langergaard, 2011). Thus, while the concepts like learning-by-interacting and learning-by-doing have been introduced and emphasized, there is a need for more thorough understanding about the nature of learning in the context of service innovation. Additional research is also necessary regarding the agency in innovation and the dynamics of the interaction process at the organizational level (Hasu, 2001; Miettinen, 2002).

Since the late 1990s, research into service innovation has rapidly accumulated. Much interest has been placed in the types and facets of service innovations as outputs (Crossan and Apaydin, 2010). Also the social features of service innovation have gained ground and include novel kinds of integration of resources among multiple actors (Calborg et al., 2014; Lusch and Nambisan, 2015). Innovation is increasingly seen as embedded in everyday social activities (Edvardsson and Tronvoll, 2013). Technical systems are essential parts in service innovations, but not always necessary (Gallouj and Djellal, 2010; Sundbo and Toivonen, 2011). In the context of intangible, interactive, and context dependent knowledge services, the modern user-based view on innovation means that the long championed 'linear approach' – the stepwise progressing innovation process – is not sufficient anymore (Gallouj and Djellal, 2010; Djellal and Gallouj, 2013).

Currently, the characteristics of service innovation are explored and discussed from multiple perspectives, and they are studied with qualitative and quantitative methods (Calborg et al., 2014). Simultaneously, researchers have called for more open, networked and integrative perspectives to describe the mechanisms triggering service innovations (Crossan and Apaydin, 2010; Chesbrough, 2011).

2.1.1 Approaches to service innovation

The growth of service innovation studies has required increased understanding of both the nature of innovation and the nature of services (Sundbo and Toivonen,

2011). For the former, the so-called Neo-Schumpeterian view of innovation has been crucial (Calborg et al., 2014; Gallouj and Windrum, 2009). Its core is a broad view on innovation which is a prerequisite for the identification of innovations in services. This view started to evolve in the mid of 1980s on the basis of the seminal article by Kline and Rosenberg (1986); the article presented a cyclical and chain-linked model of innovations. For the latter, an important step was the separation of the unique service experience from the concept and prototype of the service. A model developed by Edvardsson and Olsson (1996) enabled this separation, and consequently the separation of innovation from tailor-made services. This clarification is essential because it brings to the fore the specific characteristic of services as *intangible, process-based products whose production often includes the participation of users* (co-production) (Sundbo and Gallouj, 2000). Later on, the postulates on users as value co-creators have influenced the understanding of service innovation as a collaborative activity (Grönroos, 2006; Vargo and Lusch 2004; 2008; Vargo, 2013).

In the 1990s, service marketing scholars defined the components of service innovation. The above-mentioned model by Edvardsson and Olsson (1996) did not apply the concept of service innovation, but the concept 'New Service Development' (NSD) with the same meaning[2]. This model has contributed in a valuable way to the analysis of the target of the service renewal, i.e. the locus of innovation. According to it, a service includes three basic and interlinked components: the service concept, the service process, and the service system. The service concept describes the way in which a solution is built up to fulfil a customer need. The service process describes the chain of activities that has to be carried out, and the service system refers to those resources and organization required to implement the concept. Renewal in one or all of the components can act as a locus of innovation. Later, NSD researchers have offered further conceptualizations of service development and broadened the focus to innovations with users (see sub-chapter 2.2).

In the 2000s, service-dominant logic (SDL) by Vargo and Lusch (2004; 2008) has gained ground increasingly. At its core is the emphasis on value-co-creation and the analysis of the nature of this phenomenon. The basic argument is that the value of individual services, as well as material products, is realized in use. Thus, *value is not 'inside' goods or services, but it is uniquely experienced depending on the user need, context, and use-situation*. Individual services and products are important as vehicles of value, and both the provider and the user are active actors in value co-creation (Vargo and Lusch 2004; 2008; Vargo, 2013). Thus, organizations should see the users, not as the targets of their selling efforts, but as

[2] The first efforts to understand these processes were drawn from the New Product Development (NPD) domain (see e.g. Johne and Storey, 1998; Syson and Perks, 2004). NPD studies are not, however, in the focus of this thesis. This thesis focuses on classical and recent studies on user involvement in service innovation literature. This literature takes into account the specific characteristics of services: intangibility, interactivity and context dependency (e.g. Gallouj and Djellal, 2010; Djellal and Gallouj, 2013).

partners and potential co-developers of innovations (Edvarsson et al., 2010; Vargo and Lusch, 2013).

Based on SDL, several authors have highlighted social aspects of service innovation and the importance of collaborative learning for the creation of innovations (Ballantyne and Varey 2006; Edvarsson and Tronvoll, 2013; Lusch et al., 2010). The development of human competencies and interactions is emphasized, and it is suggested that the focus of providers should be extended from the provider-customer dyad to the relationships between multiple actors (Vargo and Akaka, 2009; Vargo and Lusch, 2008). From a learning perspective, this is important because it brings to the fore collaboration and experimentation with a service mind-set (Payne et al., 2008; Vargo, 2013). However, SDL is a young research branch and has not yet been bridged with learning studies at a detailed level.

In relation to the research interests of this study, the contribution of SDL lies especially in its emphasis on service-orientation and a service mind-set in everyday work. Organizations should learn to acknowledge the potential of users and their active role in the value-creation and development of novelties. Understanding the context of users and supporting their value creation processes is a learning challenge for the service provider organizations.

2.1.2 Defining service innovation

Despite the growing interest in service innovation, only a few definitions of the concept are presented. Many definitions classify different innovation types rather than describe what the concept actually means. According to Carlborg et al. (2014), service innovation research is currently in a 'multidimensional phase'. The concept is defined broadly to include *both value creation processes and combinations of novel services and products*.

This study uses the definition by Toivonen and Tuominen (2009), based on the Schumpeterian view on innovation: 'A service innovation is a new service or such a renewal of an existing service which is put into practice and which provides benefit to the organization that has developed it; the benefit derives from the added value that the renewal provides to the customers. In addition, to be an innovation the renewal must be new not only to its developer, but in a broader context, and it must involve some element that can be repeated in new situations, i.e. it must show some generalizable feature(s). A service innovation process is the process through which the renewals described are achieved.' (Toivonen and Tuominen, 2009, p. 893.)

The relative nature of newness is an important aspect in the definition of Toivonen and Tuominen (ibid.). A novelty put into practice might be an innovation even if it is a common practice in a different context compared to the one where it was developed (cf. Crossan and Apaydin, 2010). For example, a self-service practice may be an innovation in public sector organizations (e.g. in healthcare) even though it has been widely utilized in private companies (e.g. in retailing). However, the definition of Toivonen and Tuominen (2009) excludes those cases where a

renewal is new to the developing organization only. These views are also adopted in this thesis as criteria for service innovation.

The definition of Toivonen and Tuominen (2009) describes innovations in individual services. However, three service specific issues, which should also be taken into account when studying service innovations, are emphasized in the most recent literature. First, *an increasing number of innovations – especially in the public sector* – are *systemic by nature*, including strong social and value aspects (Bessant and Maher, 2009; Hartley, 2005; Kivisaari et al., 2013). For instance, if the service production is decreased and costs are cut in one area of public services, societal problems may emerge in another area. This is why recent innovation literature also uses the concept of social innovation to refer to collaborative innovation processes addressing complex economic and social problems (Rubalcaba et al., 2013; Ruiz Viñals and Parra Rodríguez, 2013). It has been noticed that the outcomes of social innovations usually arise in the form of a service innovation, but the processes of creation and diffusion take place at three interlinked levels: at the grassroots level among individual citizens and employees; at the intra- or inter-organizational level by private, public, and third-sector organizations; and at the societal or policy level in the form of fundamental, systemic changes (Harrison et al., 2010).

Identifying the transition from one service to another is much more difficult than recognizing an industrial product as a new one (Preissl, 2000). This phenomenon is linked to second service-specific issue: *the important role of incremental innovations*. Incremental service innovation refers to improving or changing individual characteristics in the outcome or processes of the service (Gallouj and Weinstein, 1997). Radical service innovations are rare and would mean opening an entirely new market or creating a totally new service system with the related new processes and benefits to the users (ibid.). Also more generally, the issue of radicalness of innovations has aroused lively debate for decades. The representatives of the Neo-Schumpeterian view have highlighted that even the most radical breakthroughs are re-combinations of existing things (e.g. Nelson and Winter, 1982; Fleming and Sorenson, 2004). On the other hand, it has been noticed that incremental innovations (including incremental service innovations) may gradually lead to more radical changes as the effects of small novelties accumulate (Jensen et al., 2007).

Third, often service innovations include, not only changes in the characteristics of the service offering, but also *a novel way to integrate social, technical, or organizational resources* (den Hertog, 2002; Edvardsson and Olsson, 1996; Edvardsson and Tronvoll, 2013; Lusch and Nambisan, 2015). The inter-mingling of these elements can be illustrated with the example of internet banking. Before the introduction of this innovation, users went physically to the bank offices to take care of their daily banking affairs. However, digitalization – internet and other technological platforms – offered the possibility to automatize many stages in the process and provide self-service. Users act as additional resources that have enabled the banks to use their own service resources elsewhere. This has required respective changes in the banks' organization, their social capabilities and technical commu-

nication channels (the service systems), and in user relationships (cf. den Hertog, 2002).

Summarizing the short general analysis on service innovation literature, we can state that the outcome perspective has dominated the discussion: the 'what' question of the new service development has been the focus. However, in the most recent literature, the systemic nature and social interactions in triggering, creating and adopting innovations have drawn attention to the process perspective: the 'how' question (Crossan and Apaydin, 2010; Edvardsson et al., 2011; Grönroos, 2006; Lovelock and Gummesson, 2004; Sørensen et al., 2013). It has been pointed out that *the core of service innovation may be the collaborative processes themselves*, which include a change in the allocation of resources between the provider and the users (Russo-Spena and Mele, 2012). Often this concerns public services in particular (Hartley, 2005). The following analysis provides a more detail view on the literature that aims at understanding the processes of service innovation in interaction with users.

2.2 Collaborative innovation processes with users

2.2.1 Users as the driving force in innovations

Von Hippel's studies (1978; 1986) were the starting point for understanding the role of users in innovation. In his empirical studies, he found out that often it is not 'a champion' inside the provider organization who creates innovations, but users give impetus for new ideas. For example, he perceived that users had provided the original idea for 80% of the most important scientific instruments linked to semiconductor processing innovations (von Hippel, 1986; 1988). Particularly 'lead-users', those who are a step-ahead of the big audience, turned out to be important for innovations. *Lead-users are defined to be familiar with market conditions which lie in the future and also benefit most from obtaining a solution to those conditions*. Thus, lead-user data could be used as a 'need-forecasting laboratory' and as a source of novel concepts (ibid.). In the terminology of von Hippel (2000), the concept of 'user innovation' refers to the finding that lead-users can be responsible for and 'lead' the process of innovation instead of the provider.

In their studies on user innovation, von Hippel and Tyre (1996) also noticed the importance of collaborative learning with users. Their study brings up everyday practices and failures in real life contexts as important phenomena for understanding the development processes in a micro-level (Hasu, 2001). However, in this work (as well as in other works of von Hippel), learning is mainly regarded as a trial-and-error process instead of a driving force behind collaborative innovation (the perspective of this thesis). In addition, the focus has been mainly on the creation of high technology products or on the analysis of technical complexity in a situation of machine use (cf. Hasu, 2001). In recent studies, von Hippel's ideas have also been utilized in the service context (Oliveira and von Hippel, 2011).

However, in the studies based on von Hippel's tradition, the main point has been to show that users are sources of innovation. Further research is needed for revealing the conditions under which user knowledge is best utilized and developed into service innovations (Hasu et al., 2011).

In the early 2000s, Chesbrough (2003) developed an approach of open innovation. His 'innovation funnel' offered an important new model to depict innovation, not only as a single company's internal process, but as a collaborative process. The main idea is that companies give to the markets those ideas they have neither time nor interest to develop, and they receive new ideas in turn. Chesbrough's work has been important in changing the view on how organizations can use external sources to choose the best ideas from the markets. The original model was targeted at the scholars and practitioners working with information technology, but later the model was adapted and developed further to be suitable in the context of service innovation, too (Chesbrough, 2011). As the analysis level of the open innovation model is between organizations, a detailed analysis of users' ideas or agency has not been the focus of the studies.

Recently several researchers have noticed that, *not only lead-users, but all kinds of users are active innovators* (Magnusson et al., 2003; Sundbo and Toivonen, 2011). The way in which users' ideas 'flow into an organization' has aroused attention and resulted in the emphasis on the user interface and the work of grassroots employees. Knowledge about the users' needs is accumulated at the user-interface, to those employees who have access to the everyday user-interaction in which new ideas emerge in turn (Hasu et al., 2011; Sørensen et al., 2013). The concept of *employee-driven innovation* has gained significance (Kesting and Ulhøi, 2010). Central for this approach is the realization that managers and professionals do not possess all creativity in organizations but it is also characteristic of average employees (Magnusson, 2009). Ordinary or layman users and employees – 'average men' – who have only little conceptual knowledge about the service in question, possess creativity and divergent thinking styles and are beneficial for innovation (Hasu et al., 2011; 2015). However, the view that layman employees and ordinary users are capable of contributing to service innovation is still in an emerging phase, both theoretically and empirically.

In the service context, the user's relationship with the service provider is usually more intensive than in the case of products (Matthing et al., 2004). Service innovation studies indicate that user involvement can benefit the service provider in multiple ways in the renewal of its existing services or in the creation of novel ones (Alam and Perry, 2002; Blazevic and Lievens, 2008; Edvardsson and Olsson, 1996; Magnusson et al., 2003; Martin and Horne, 1995). Providers obtain immediate feedback which permits rapid solution of service delivery problems (Johne and Storey, 1998), and user participation has proved to be important when tailoring or developing new services and concepts (Blazevic and Lievens, 2008; Syson and Perks, 2004).

The existing research can be divided into two basic ways of understanding user-based service innovation. First, *users' needs and contexts can be taken as the starting point of the development* in a situation where the service provider has the

main responsibility for innovation (cf. Zeithaml et al., 1990). Second, *users can act as innovators when they participate in the development*. The former means giving the users an opportunity to comment on the service provider's views, or collecting information from, about, or with users. The second approach reflects a deeper way of user involvement: here the users are active actors in the generation and implementation of innovation (Magnusson et al., 2003; Sundbo and Toivonen, 2011). Based on these two approaches, Sundbo and Toivonen (2011, p. 6) define user-based service innovation as follows: 'the development of a new or modified service, or the conditions of its production, in a way, which 1) emphasizes the acquisition of deep and shared understanding in the development process, and actually utilizes this understanding in the development process; and/or 2) co-develops innovation together with users.' The separation of these two practices is in a central position in this thesis. The first approach is called 'user-driven innovation' and the latter approach 'user-based innovation'.

In addition to the different roles of users, a central issue is *the nature of the innovation process*. As described above, the general focus of service innovation research has changed from producer-centered processes, handling the users as the passive audience or target, towards collaborative development (Calborg et al., 2014; Sundbo and Toivonen, 2011). There are, however, differences regarding the extent to which an innovation process is seen as a systematically progressing process or alternatively as a process whose core is experimenting with the users. In the following, these alternatives are discussed.

2.2.2 Planning-based innovation processes

Especially scholars representing the school of New Service Development (NSD) have analyzed service innovation processes as a systematically progressing process. The original NSD approach has adopted its basic ideas from New Product Development (NPD), in which the main attention is drawn to the phases of development and the so-called 'stage-gate model' is favored. Here, the process proceeds as a 'ladder' in which the steps of 'go' vs. 'kill' decisions take turns (Cooper and de Brentani, 1991). The following main phases are generally separated: 1) the emergence of an idea at the fuzzy front end; 2) the development of the idea; and 3) the application of the idea to the markets, and thereby to the users (de Jong and Vermeulen, 2003). The model is rather normative, suggesting that a systematic development process is the prerequisite for success (Cooper and de Brentani, 1991).

Toivonen (2010) calls this type of an approach 'planning-based' because the innovation process is designed in advance. Sørensen et al. (2013) refer to it as 'directed' because the process often has, or at least should have, managerial support. A typical problem of this type of innovation process is slowness, due to which a more effective practice is suggested by a compression strategy: a parallel conduct of several phases. It means that the predictable series of development is accelerated, together with the involved actors (Alam, 2002). Alam and Perry (2002) have made one of the most well-known efforts to show how users can be

involved systematically in an NSD process which follows a stage-gate model. A multiplicity of other actors may also participate in addition to users, which highlights interactivity but creates challenges in the originally simple and easily foreseen development.

In the NSD approach, the development processes are well described, and in practice different stage-gate models have been popular. Developers, managers, and decision makers benefit from their visibility and measurability when supporting innovation. However, despite the improvements – the compression and user involvement – these kinds of processes are inefficient in producing novelties that would answer the changing service needs of the users and society in a sufficiently rapid pace (Toivonen, 2010). Even the revised planning-based models are rather provider-driven and represent quite a static approach to innovation (Tronvoll et al., 2011).

The main benefit of a stage-gate based NSD is the structure brought to the development and its management (Alam, 2002; Alam and Perry, 2002; Syson and Perks, 2004). On the other hand, critics have pointed out that this primary attention to the structure neglects the contents and right timing of the development (Engwall, 2001; Toivonen, 2010; Strandvik et al., 2012). Mechanisms for the generation of innovation do not take sufficiently into account various actors and specificities of the context (Koen et al., 2002). Particularly in knowledge-intensive organizations, professionals often have different interests, time dimensions, and communication practices which can be challenging to overcome (Bartunek and Rynes, 2014). An approach which does not take into account *the motives, aims, and results of innovation* is easily too universal.

The newest NSD approaches have tackled this challenge. For instance, Gottfridsson (2010; 2012) and Matthing et al. (2004) have modified the original model to take better into account the dynamic nature of collaboration and the context of development. In relation to the research interests of this thesis, their work on collaborative development processes is particularly important. They have noticed that these processes often resemble *complex, uncertain, and iterative learning activity* instead of predefined 'stages' (ibid.). Thus, it seems that the topic of learning is emerging in the NSD studies. In order to understand more deeply the nature and mechanisms of learning in the context of innovation, it would be beneficial to tighten the link between the NSD and learning perspectives. This research contributes to this aim by studying how the dynamics and learning in individual NSD processes could be combined to the organization-level dynamics and learning.

As mentioned above, service researchers have increasingly paid attention to encounter-based innovations (Sørensen et al., 2013), and bottom-up innovation processes with employees are coming to the fore (Hasu et al., 2011; 2015; Rubalcaba et al., 2012). This requires understanding of the complex social processes, the users' perspective, and the relationships and practices of actors (Dougherty, 2004). Thus, the 'discovery' of the importance of the grassroots level innovation activity pushes the focus towards constructive, non-linear, and practice-based innovation models (Sundbo and Toivonen, 2011). In these models, rapid, experiential and iterative views are central (Engwall et al., 2001; Toivonen, 2010). Re-

searchers have noticed that experimentation can be more important than planning or an innovative idea can even be found after a change in practice (Eisenhardt and Tabrizi, 1995; Sundbo, 2008) – alternatives that are discussed next.

2.2.3 Practice-based innovation processes

Practice-based and experiential views have aroused increasing interest as novel ways to understand how innovations evolve (Crossan and Apaydin, 2010; Engwall et al., 2001). Experiential and dialogical human performance is suggested to be the most effective response in unpredictable, context depended situations (Sundbo, 2010). Early studies in this field represent both the research stream of situated and practice-based learning (Lave and Wenger, 1991) and the research into service innovation. The former group of studies include, among others, Dougherthy (2004) and Orlikowski (2002). In the latter group the approach of 'bricolage' has gained ground in particular (Baker and Nelson, 2005; Fugelsang, 2010; Fuglsang and Sørensen, 2011; Garud and Karnøe, 2003).

Based on the analysis of situated and practice-based learning, Dougherty (2004; also Dougherty and Dunne 2012) states that the employee knowledge that resides in the ongoing actions and practices is necessary for innovation. Work activities, in which the subjects and their knowledge and acting are integrated, can be understood as the practice-based locus of innovation (ibid.). Consequently, the key point is that the creation of innovations is embedded in the social, situated work activities, and innovations arise out of everyday actions and collaborative learning (Ellström, 2010; Melkas and Harmaakorpi, 2012; Orlikowski, 1996; 2002). In the similar vein, Melkas and Harmaakorpi, (2012) argue that in practice-based innovation the focus is on processes triggered by problem-setting in a practical context. These processes are conducted in a non-linear way, utilizing scientific and practical knowledge in cross-disciplinary networks through changes in practice.

Orlikowski (2002) studied the success factors of a global IT company and concluded that the success was not attributable to any single factor, such as a particular technology, strategy, leader, or development skills. Rather, the success was based on an ongoing, collective competence in knowing how to innovate and deliver timely complex IT solutions in a global organization. This collective competence emerged from peoples' everyday actions and capacity to enact. It was enabled by the organization's support to its members: favoring the constant participation, interaction, and learning by doing in local contexts. The promotion of creativity – allowing a diversity of ideas and experiences to be expressed and shared – generated innovations and innovation know-how (Orlikowski, 2002).

In the field of service innovation, the concept of 'bricolage' has gained ground recently. Its origins are in the anthropological research (Lévi-Strauss, 1967), but nowadays it has become popular among the researchers of practice-based and employee-driven innovation. The basic idea is that innovations emerge when solutions need to be created with what 'whatever is at hand' and by 'do it yourself' mentality (Fuglsang, 2010). Thus, *bricolage highlights resource constraints as a*

source of innovation (Baker and Nelson, 2005). In the process of bricolage, competences and solutions are created via 'learning by doing'. By its nature the process is emerging and interactions as well as experiences among different actors play a crucial role (Garud and Karnøe, 2003). Often the innovations are small changes to the existing practices but, over time, such changes can accumulate and result in more significant changes (Fuglsang and Sørensen, 2011).

The main difference between practice-based and planning-based innovation processes can be summarized as a shift of attention from the structure and generally applicable features to *the context, actors, competences, and timing of the development.* However, some elements of the practice-based processes could be explained in a greater depth. The studies do not seem to reveal in detail the learning steps that emerge in the 'learning by doing' processes. In addition, the issues of how practice-based innovation actually occurs with or by users, and how their roles and agency become successfully involved in innovation processes could be explored more profoundly (cf. Hasu et al., 2015; Crossan and Apaydin, 2010). An important issue in the utilization of the practice-based approach is also how organizations could pursue this 'bottom-up' and non-planned development logic continuously and systematically. In other words, a question arises how to transfer the results of practical interaction to the broader organizational context. If the practice-based changes are not linked to a conscious strategic activity that supports the generation of innovations, there is a danger of relying too much on individual trials and errors in use situations (Fuglsang and Sørensen, 2011).

Consequently, *it is important to combine the bottom-up approaches with the strategic orientation in innovation* – in this thesis particularly in service innovation. The strategic orientation includes a managerial perspective to innovation and discussion about suitable organizational structures and conditions that foster innovation. In the following sub-chapter, two concepts are introduced in order to elaborate this view: the concept of 'innovation as strategic reflexivity' crystallizes the managerial view and the concept 'service encounter-based innovation' depicts the bottom-up phenomenon to which the managerial view should be combined (Sundbo and Fuglsang, 2002; Sørensen et al., 2013).[3]

2.2.4 Strategic orientation combined with user-based innovation

The concept of service encounter has been used to describe the situation where the service provider and the user meet (Bitner et al., 1990; Czepiel, 1990; Grönroos, 2006). Payne et al. (2008) define it as the process which involves a series of two-way interactions and transactions between the provider and the user. They state that 'popularly' speaking a service encounter refers to the different 'touch

[3] In this chapter, the strategic view is discussed from the viewpoint of *innovation strategy* (Sundbo, 2000). The topic of organizational strategy in a broader sense is handled in sub-chapter 2.4, but even there the perspective is restricted: in this thesis, foresight and evaluation have been selected as strategic processes that form the 'landscape' for innovation activities and support the conceptual analysis of practical results of innovation processes.

points' and 'contacts' that can occur either on the initiative of the service provider or of the user. Sørensen et al. (2013) highlight the grassroots level interaction, defining the service-encounter as a dynamic moment, time, and place when and where employees need to sense and learn together with users and many unforeseen events can occur (cf. Hasu et al., 2011; Heusinkveld and Benders, 2005).

However, employees might lack the strategic support and perspective for creating and detecting innovations in the service encounters (Greer and Lei, 2012: Saari et al., 2015). Implementing an encounter-based innovation in an organization may be challenging because it creates uncertainty and change needs which require coordination across organizational subunits (Kanter, 1988). There are also challenges that do not reflect the lack of direction, but an excess of direction: organizations may not be capable of utilizing the potential of service-encounters because employees and specialists work detached from the users with predetermined plans (Martin and Horne, 1995).

Sundbo and Fuglsang (2002; also Fuglsang and Sundbo, 2005) suggest *'strategic reflexivity' as an approach that appreciates activity at the user interface but also highlights the importance of reflecting the purpose of the organization, the goals of the actors, and interpretations of the interplay with the environment*. According to this view, service organizations should create strategic and reflexive orientation towards innovation at three levels. First, there should be a reflexive stance towards the organizational environment. Second, the structures inside the organization should be in line with this orientation. Third, the interaction between individual actors in the organization should be a primary task.

In this context, the term 'strategy' refers to innovation strategy in particular; it answers the questions: why, when and how to innovate. The role of management is important in building the innovation strategy of an organization (Crossan and Apaydin, 2010; Sundbo, 2001; Sundbo and Fuglsang, 2002). From the viewpoint of the strategy, innovation management is not restricted to the development of single products or services, but it is an activity for seeking novel market opportunities and creating visions of them. Encouraging the participation of employees and users is an essential part of innovation management. Managers can 'orchestrate' the thoughts and attempts of employees to a favorable direction by supporting them in finding a specific role that helps them to channel their decision making (Sundbo and Fuglsang, 2002).

The interaction between management and employees can be understood by using a sociological argument about the dual structure of society (Giddens, 1984). Sundbo (1997) has transferred this idea to a service organization. According to him, an organization consists of an official management system and practices, and a loosely coupled, interactive and informal social system producing ideas. These structures function with different logics. The managerial system operates mainly with hierarchical and planning-based logic that guides the organization's innovation activities. The loosely coupled, informal system is the locus or heart of creativity where ideas emerge and are shared and distributed via the interaction between employees. *The task of the management is to stimulate but also control and channel the ideas of employees* – to inspire the employees but also help them to link

their ideas to the general goals of the organization, and on this basis to select the ones that will be developed further (Sundbo, 1997).

Sørensen et al. (2013) have modified the dual framework to be applicable in the context of encounter-based innovation. They use *a division into an organizational support system* and *a front office innovation climate*. The former refers to the structures and processes in the organization's back office and the latter to the employees' perceptions of their work environment affecting their creativity. In the modification, the loosely coupled interaction system has been extended to include the users in addition to the employees, and the intra-organizational context has been extended to include the operational environment at least to some extent. The support system (management) should facilitate employee creativity and integrate the results of that creativity (service innovation) into the organizational goals. It should also help the employees and users in disseminating and institutionalizing the local innovations as an 'officially recognized' way of working. Because this view is very close to the research interest and research questions of this thesis, it is opened up in detail in the following. Figure 2 presents the model in its original form (ibid.).

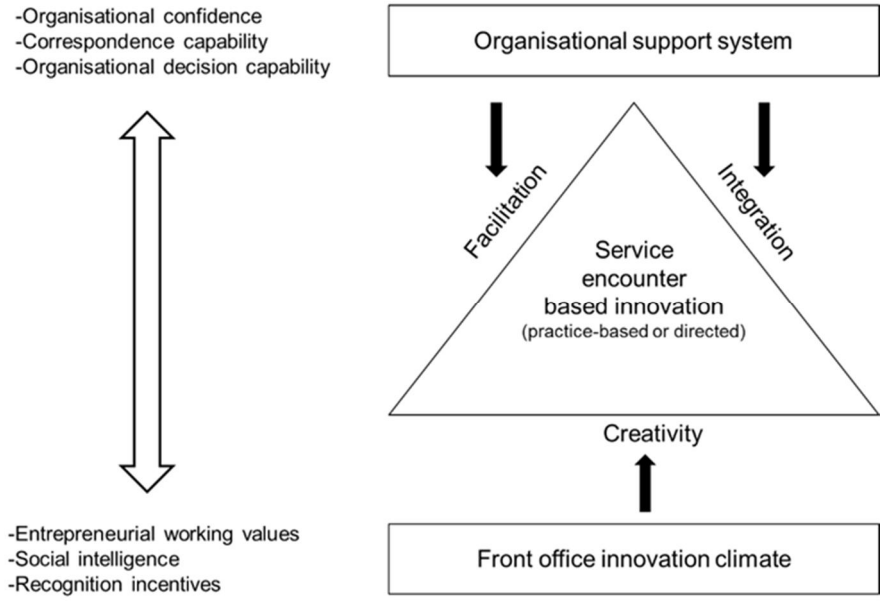

Figure 2. Model of organizational conditions for service encounter-based innovation with employees and users (Sørensen et al., 2013).

The model of service encounter-based innovation (Sørensen et al., 2013) specifies six conditions that favor the emergence of innovations. Three of them

(demonstrated on the upper left part in Figure 2) are related to the organizational support system and three to the front office innovation climate. The former include organizational confidence, correspondence capability, and organizational decision capability. Organizational confidence refers to the management's and development departments' trust in the capabilities of the front-line employees and to the collaboration between different departments. Correspondence capability refers to the suitable structures of communication channels where different views and ideas can be negotiated. For example, if an organization is very hierarchical it takes a long time for the management to recognize ideas from the employees and users, if at all. The decision capability concerns the management's ability to choose between ideas to be further developed or innovations to be given recognition as official ways of working and worthy of diffusion to the broader environment.

The organizational conditions most influencing the innovation climate are entrepreneurial working values, social intelligence, and recognition incentives (demonstrated on lower left part in Figure 2). Entrepreneurial working values refer to the values in an organization that support the employees' genuine will to solve better the problems of the user. Here the recognition by the management or the environment is important. Social intelligence is defined as the employees' capacity to understand, observe, and take seriously the needs of the users. This requires putting oneself in the situation of the user – perceiving the problems from his/her point of view. The capability to read and understand the users' needs requires a kind of 'anthropological' expertise (Sørensen et al., 2013). Recognition incentives do not refer to the traditional reward systems, but to social recognition. This means that employees' contributions are taken seriously in the organization and employees receive feedback regarding the 'destiny' of their input: where does it go, who handles it, and why is it appreciated? (ibid.)

Sørensen et al. (2013) note that the six conditions as well as the organizational support system and the front office innovation climate (demonstrated on the right part in Figure 2) are important for innovations to occur. The authors clarify that the front office innovation climate is dependent on the *creativity* of the employees and the organizational support system should aim at both *facilitate* that creativity and *integrate* its results to the organization. These elements (creativity, facilitation and integration) are interdependent and necessary in both practice-based (bottom-up) and directed (top-down) innovation processes (Sørensen et al., 2013). As a result, the authors (ibid.) argue that significant innovation outcomes are most probable when the different processes and practices of bottom-up and top-down meet each other. Starting from this argument, Saari et al. (2015) suggest that the point where bottom-up and top-down innovation processes meet should be seen as critical for the innovation management.

The work of Sørensen et al. (2013) and Sundbo and Fuglsang (2002) describe well how ideas for innovations derive from multiple sources in a service organization. The impulses of users are communicated to the organization by grassroots employees in different practice- or planning-based processes. Also managers and the innovation strategy are seen as important sources of innovation.

Sundbo and Fuglsang (2002) and Sørensen et al. (2013) suggest that the task of the management is important in the merging the different, often unconnected impulses. Managers should stimulate and facilitate employee creativity as well as integrate the results of that creativity (service innovation) into the organizational goals and routines. The researchers do not, however, describe in detail *the actions* through which this merging is realized *and the actors who carry it out in practice*. Saari et al. (2015) have concretized this point. They have examined those concrete 'management deeds' that make the bottom-up and top-down processes to meet in public service innovations. They have also described various coordination mechanisms – personal, impersonal, and group modes – and highlighted the role of middle management, in particular, in providing the 'bridging' activities.

More theoretical and empirical insights are still needed about *the actions, activities, and mechanisms* that enable the transformation and bridging of the grassroots ideas into recurrent and officially recognized activity patterns in organizations. The question of bringing mundane ideas to a higher abstraction level and integrating them as a collective practice is near to the descriptions of change and development in an activity (Fuglsang and Sørensen, 2011). This study suggests that in-depth understanding of these processes can be found from the theories of organizational learning.

Research on organizational learning propose that organizational learning might be a primary mean to foster innovation in an organization – however, this requires that learning combines cognition and action, and is combined between individuals, groups, and organizations (Crossan et al., 1999; Crossan and Berdrow, 2003; Paavola et al., 2004; Stata, 1989). The theories that shed more light on how this can be done are examined next. The focus is on the learning theories that open up the mechanisms for discontinuous development steps in a collective activity and depict what kinds of organizational processes are needed to support this aim (Dewey, 1910; Engeström, 1987).

2.3 Organizational learning and mechanisms to contribute innovation

The phenomenon of organizational learning is diverse and has aroused interest in many disciplines, such as in psychology, sociology, knowledge management, strategic management, and developmental work research (Bapuji and Crossan, 2004; Crossan et al., 1999; Easterby-Smith, 1997; Engeström and Sannino, 2010; Lähteenmäki et al., 2001; Stata, 1989). This spectrum of scientific approaches means that the phenomenon is approached through multiple different lenses and backgrounds. The different epistemological and ontological premises affect the issue of how organizational learning is understood to take place and how the phenomenon is studied.

In the literature on organizational learning, both individuals and organizations are referred as the entities of learning. Huber (1991, p. 89) defines that an entity, be it an individual, group, or organization, 'learns if through its processing of infor-

mation, the range of its potential behaviors is changed'. This definition does not describe how learning actually takes place. However, there is no consensus on the entities and processes of organizational learning (e.g. Antonacopoulou, 2006). Some kind of loose consensus seems to infer that organizational learning is manifested in 'collective and recurrent activity patterns' that can also be described as organizational routines (Argyris and Schön, 1978; Crossan et al., 1999; Fiol and Lyles, 1985; Senge, 1990).

According to Easterby-Smith (1997), Easterby-Smith et al. (2000) and Antonacopoulou and Chiva (2007), the most typical views on organizational learning can be divided into two mainstreams: learning can be understood as either *an individual, cognitive process* or as a *socio-cultural process*. The individual-cognitive view on learning stems from the cognitive learning psychology which characterizes learning as the *acquisition of new knowledge and skills inside an individual mind* (ibid.). The scholars in this research area often understand organizational learning as the product of individual learning that is transferred to the organizational level through the articulation of the mental models (cf. Kim, 1993). Hence, this approach focuses mainly on the underlying cognitive characteristics of learning and not on the ongoing cycles of action and behavior.

The second line of research relies on the participation metaphor and examines organizational learning as a process of *participation and adaptation in various cultural practices* (e.g. Gherardi, 2000; Gherardi et al., 1998). This socio-cultural perspective emphasizes that people learn through engaging with others at the workplace and when participating in communities of practice (Lave and Wenger, 1991; Star, 1995). It means that everyday work activity is seen as the locus of change and development. The focus is not on the individual mind but more on the collective 'knowing' where knowledge, activity, and context are inseparable (Nicolini et al., 2003). Gherardi (2000; Gherardi et al., 1998) notes that, in general, organizational learning theories have gone through 'a silent revolution' in which learning has begun to be understood as a social, contextual, and cultural process emerging from the development of everyday work. However, an issue which would benefit from additional studies is how this kind of learning could be utilized for the purpose of more radical changes in the activity or enhanced for the purpose of strategic renewal (Crossan et al., 1999).

This is the interest of the present study. It aims to understand in depth the mechanisms of how organizational learning takes place as such a *new knowledge creation and transformation in an activity that can create discontinuity and bigger qualitative changes.* The question is about the analysis of learning as exploitative and explorative processes of developing something that *does not yet exist* (Engeström, 2004; Paavola et al., 2004). The concepts of exploitation and exploration were introduced by March (1991) in the organizational learning literature. According to him, exploitation includes issues such as refinement, efficiency, and implementation which infer making (usually local) improvements within existing logics and structures. Exploration entails the change of those logics. It can be captured by terms such as search, experimentation, risk taking, flexibility, and innovation.

The theorizing of organizational learning as a new knowledge creation and transformation in an activity has been approached on the basis of different epistemological and ontological premises. For example, Nonaka and Takeuchi (1995) – representing the school of knowledge management – have approached the phenomenon from a knowledge conversion perspective. They describe how to transform the knowledge of the individuals into the knowledge of the organizations. Their SECI model illustrates how to convert tacit knowledge into explicit knowledge and explicit knowledge into tacit knowledge. This interplay between tacit and explicit knowledge takes place through the processes of socialization, externalization, combination, and internalization.

Scholars representing the developmental work research (e.g. Engeström, 1987; Engeström and Sannino, 2010) approach learning through the lens of activity development in work organizations. They apply ideas from the cultural-historical activity theory (Leontjev, 1978; Vygostky, 1978) and emphasize social participation in a context. Most importantly, utilizing cultural-historical activity theory, they have created a model of how to analyze learning as an *expansion and transformation of an activity* (Engeström, 1987; Engeström, 2004). The interest is in theorizing and studying organizational learning, not as an adaptive, but as a transformative process that can change and create new activity as seeds for innovations (Blackler et al., 2000; Blackler and Regan, 2009; Engeström, 1987; Engeström and Sannino, 2010). This approach is in line with the main interest of this thesis, which justifies exploring the theory and phenomenon of expansive learning more deeply.

In our empirical studies (Articles I–III), the theory of expansive learning is explicitly used for the purpose of understanding innovation activities, especially service innovation with users. For this purpose, I next introduce the theory of expansive learning and its key concepts (Engeström, 1987; 2004; 2007).

2.3.1 Key concepts of the theory on expansive learning

The theory of expansive learning characterizes organizational learning as a collective and transformative activity taking place in an activity system. 'Activity' is systemic by its nature and comprises the individual and short-termed 'action' as well as the collective dimension of 'interaction' (Engeström, 1987). The theory of expansive learning endorses the idea that a qualitative renewal of an everyday activity in an organization may serve as the foundation for an innovation. The concept of expansion includes the idea that radical qualitative renewals in activity – development, expansive shifts and transformation – are possible as a result of learning (Engeström, 1987; 2001).

Expansion refers to the kind of collaborative learning process in an organization in which learners focus on re-conceptualizing the object of the activity to embrace a radically wider and more suitable horizon of possibilities, in relation to the historical development phase (Engeström, 1987; see also Paavola et al., 2004). Engeström (ibid., p. 169) has defined the concept as follows: 'The emergence of thoughtfully mastered learning activity or "learning by expanding" implies the ex-

tension of thinking into an activity, and the merger of learning and thinking into one unified process at this level'. He has also specified that: 'Such a new type of transition implies an emerging of collectively and expansively mastered activity type' (ibid., p. 222).

The history of the theory of expansive learning dates back to 1987 when Engeström and his colleagues started 'developmental work research'. The foundational ideas for the organizational and work development, as well as learning, were sought mainly from the Russian school of *cultural-historical activity theory* by Leontjev (1981) and Vygotsky (1978), but ideas from pragmatic learning theory were also applied (Dewey, 1910). From Leontjev (1981), Engeström adopted the view that it is important to move the focus from the single actions of humans to the new models of collaborative activity.

The theory of expansive learning is near to the sociocultural learning approach (Gherardini et al., 1998), in which organizations are seen as culturally and historically unique sites. It is also near to the view on action learning by Argyris and Schön (1978; 1996). They describe the need for the learners to become aware of their 'theory-in-use' and to learn to renew their meaning schemes by 'double-loop learning' (ibid.). Action learning is also a term generally utilized in practical and 'consultancy type' learning approaches, where a researcher or a facilitator aims to change the target under study via an open-ended process, in order to examine the change and its prerequisites (see Smith and O'Neil 2003a; 2003b). The theory of expansive learning, however, differs from the approach of action learning in its strong theoretical background: the cultural-historical activity theory (Leontjev, 1981; Vygotsky, 1978). Also its theoretical tools differ from the tools used in action learning. The theoretical tools of expansive learning are described in the following.

Like the cultural-historical activity theory, the theory of expansive learning considers that *human activity is always object-oriented and mediated by tools* (Leontjev, 1978; Vygotsky, 1978). The object of activity refers not only to a material object (like a hammer) or a short term or definite goal or target. The object of an activity is described as a heterogeneous and internally contradictory purpose of a collective activity system that motivates and defines the horizon of possible goals and actions (Engeström, 1987; Leontjev, 1978). As an example, an object for a decorator could be to create stylish, livable and functional houses – not only to nail paintings on the walls.

The theory of expansive learning focuses on the broader historical development of the activity in a societal context. People aim to reach the object by using certain tools that can be material or more abstract, such as conceptual tools. These tools mediate the intellectual and practical operations, reflection and learning (Leontjev, 1981). *Work in an organizational context takes place in a certain social community, with historically developed rules and division of labor* (Engeström, 1987; Leontjev, 1978) which define, for example, who are or can be the subjects of the work. *This interlinked system forms the activity system* (Engeström, 1987) that is understood as the basic unit of work and is often used as the unit of analysis in the expansive learning studies and interventions (Figure 3).

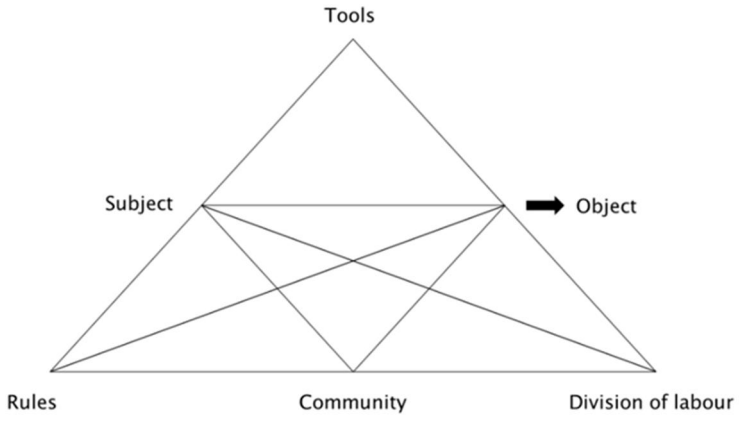

Figure 3. The activity system as a unit or working and learning (Engeström, 1987).

The activity system (Figure 3) is a systemic constellation which is in constant interaction with its environment. A change in any element of the activity system, or the suitability of the object with the environment, means *tension and contradictions in the system*. These tensions and contradictions are signals, not just of a one-off event, but of a more systemic contradiction and potentially emerging transformations as new directions for the activity system (Engeström, 1987; Hasu, 2001). Tensions and contradictions are important as they *generate the possibility and motive for learning and development*. If they are approached reflectively, and by making corresponding changes and re-organizing the activity system, it is possible to find a more suitable concept of activity (Engeström, 1998; 2004). Thus, the learners should focus, not just on the problem at hand (described as single-loop learning by Argyris and Schön, 1996, or as tactical learning by Dodgson, 1991), but also on the wider context that generates these problems.

Expansion takes place in a zone of proximal development (Vygotsky, 1978; Engeström, 1987) which refers to the creative and ambiguous 'space' and 'shifts' from single actions to a broader object of activity. The refocused object of activity and the corresponding new concept require often a transformation, 'big qualitative jump', both in cognition and in activity. The transformation takes place in a forward looking expansive learning process.

The original model of expansive learning consists of five phases (Engeström, 1987): First, a primary contradiction causes the need for change. Second, an analysis is required in order to understand what has to be changed in the activity system in order to meet the contradiction – this phase is called a double bind situation. Third, an expanded object of activity needs to be constructed, which also requires re-modeling the activity system (creating a new concept of activity). Fourth, an application emerges in a process where ideas are transformed into activity. Fifth, consolidation of the new concept of activity takes place through reflection and generalization. Later on, Engeström (2001) has modified the model

to include separate phases for the model and its implementation and a new phase for the reflection of the results (Engeström, 2001). In this thesis, the more widely used original model is used as the starting point.

Thus, expansive learning requires exploitation of the previous concept of activity, conceptualization of what needs to be changed, and exploration of the novel concept in practice. This means that expansive learning includes *conceptual and strategic learning* (Engeström, 2004; 2007; cf. Dodgson, 1991), which is the level of learning that organizational learning scholars are looking for and trying to conceptualize (Crossan et al., 1999; Crossan and Berdrow, 2003). Expansive learning provides a model for 'learning how to learn'. It combines cognition and action and includes exploration and exploitation of the activity at multiple levels. This kind of an organizational learning process can take place on its own, but it benefits from the support of facilitative actors and learning interventions (Engeström, 1987; 2001; Engeström et al., 2014).

A 'co-configuration' setting is the most recent form of applying expansive learning (Engeström, 2004; 2007). It means that *active user involvement, continuous relationships of mutual exchange, and collaboration between multiple activity systems* are needed. Often, interaction and shared objects between multiple activity systems and actors are needed in an environment where no one has ready-made rules (Virkkunen, 2006). Rather, real-time feedback, interpretation, negotiation and the synthesizing of information between the parties is required. This view has common points with the service theories on the co-creation of value (Vargo and Lusch, 2008) and on the co-development (Edvardsson et al., 2010). It is also well in line with the research interests of this study.

In his 2004 and 2007 articles, Engeström investigates forms of expansive learning in the context of co-configuration. Concepts such as *boundary crossing, multi-voiced dialogue, and negotiated knotworking* are introduced. Boundary crossing refers to reciprocal interaction situations where learners 'step across a familiar border' in series of acts that may be multistage, timely and spatially dispersed. Multi-voiced dialogue emphasizes that dialogue is needed among multiple actors, and knotworking adds an object-perspective to the concepts. It refers to those kinds of shared planning and problem-solving activities that are conscious attempts to form a shared object by actors from different activity systems. The knotworking situations include boundary crossing in temporary teams but are directed towards the shared object. This kind of an object is similar to the 'boundary object' that Star and Griesemer (1989, p. 393) define as follows: 'Objects which are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites'.

Expansive learning in a co-configuration setting can be illustrated with a hypothetical example. If many people with sore knees arrive in the doctor reception, the idea is to perceive the object of activity – not only as the treatment of the sore knees – but expand it towards the broader reasons of why there are so many cases of the same type. A motive for learning emerges when the doctors start perceiving the issue as part of the patients' lifestyle and as a societally topical problem (obesity). However, for the expansion to occur, the doctors need to im-

plement the new object in their work practices, rules, and community. This could include, for example, collaboration with users (how they should take the responsibility for changing their lifestyle habits) and collaboration with colleagues from different fields of medicine (cf. Norros, 2004).

The shared problem-solving activities and practice-based experiments between multiple actors discussed in expansive learning (Engeström, 2004; 2007) have similarities to the discussion about novel ways of understanding how innovations evolve as a process of 'learning by doing' (Fuglsang, 2010; Fuglsang and Sørensen, 2011). To analyze more in-depth how the mechanisms of concrete learning steps and processes of 'learning by doing' emerge, the classical learning theory by Dewey (1910; 1938) is presented in the next section. Miettinen (2000) has used elements and ideas of this theory to supplement the views of expansive learning. Dewey's theory emphasizes experimentation and experiencing in real life contexts.

2.3.2 Learning theory of reflective thought and action

John Dewey (1859–1952) developed a learning theory of reflective thought and action in the 1910's. Dewey's (1910; 1938) key finding was that learning takes place in experimenting and experiencing in real life contexts. In other words, learners must be *active in the practical problem solving processes*.

Miettinen (2000) has provided an important clarification of Dewey's work and ideas. Dewey took as the point of departure biology and the organism's adaptation in its environment and applied it to human social practice. In order to survive, organisms have to adapt to the changing environment and it also holds true for humans. Humans, however, form habits and routine ways of doing and acting in practical and material life activity. These habits are mostly non-reflective and dominate human experience. When these habits do not function, problems and uncertainty emerge. These problems can be solved through reflective thought and action. To change a habit, an investigation of the broader conditions of the situation is required (Dewey, 1910; Miettinen, 2000).

The process of reflective thought and action has five phases (Dewey, 1910; Miettinen, 2000). It starts when an individual faces disturbances in the habitual, practical ways of acting and in their suitability to the environment. This means that when a doubtful and uncertain situation is met, a habit does not work. Second, a pause is needed, during which the learner intellectualizes and defines the problem (Miettinen, 2000). Third, the learner should intellectualize and study the conditions of the situation. Dewey (1910; 1938) describes that through reflection it is possible to understand the need for a change in the way of thinking and acting. At this phase the learner also forms certain hypotheses of alternative ways of thinking and acting that can be called 'working hypotheses' or guiding ideas for the new solutions. Fourth, reasoning is done by thought experiments that can lead to the reformulation of a working hypothesis. Dewey (1910) highlights that these hypotheses can only be tested in practical action, in experiential activity by experiencing, and in this way they might solve the problem that caused the need for reflection

(Miettinen, 2000). This takes place in the fifth phase of Dewey's model, demonstrated in Figure 4 (adopted from Miettinen, 2000).

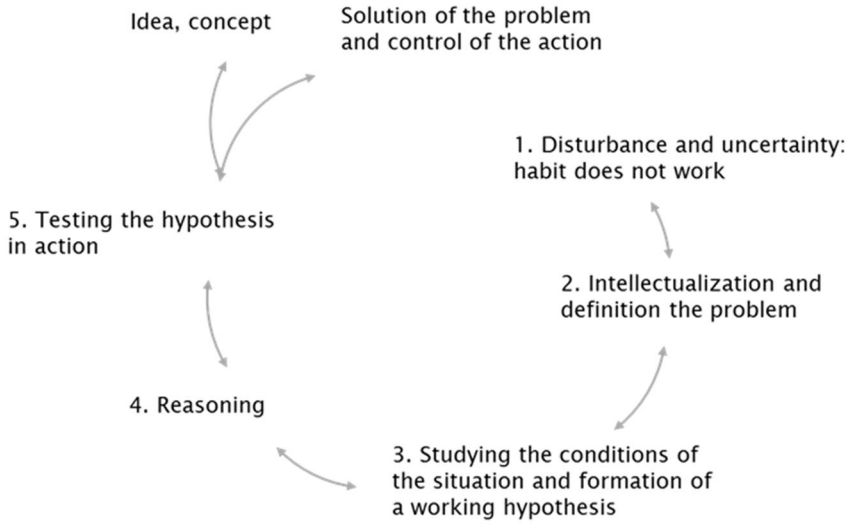

Figure 4. Dewey's model of reflective thought and action (Miettinen, 2000).

While learning takes place in a context by experimenting and experiencing, the working hypothesis enables comparing the outcome to the starting point and in this way makes learning possible. This comparison also differentiates the process from learning based on trial and error (Dewey, 1910; Miettinen, 2000). Learning can have two kinds of results: the initial problem becomes resolved and a more conceptual thinking and meaning is produced for the future actions (ibid.). However, empirical experience itself does not necessarily contain criteria for evaluating the suitability of the action more generally. This is why the hypothesis and *more conceptual thinking and evaluation criteria are important* (Miettinen, 2000). Hence, the relationship and tension of the actor's experiences and her reflection is vital in the learning process (Dewey 1910; 1938). When people become aware of their observations and their context, and they are made visible, they can be *critically transformed by reflection.* This way can be turned into enriched thought and action: an issue which comes close to the phenomenon of expansive learning (Engeström, 1987; Miettinen, 2000).

To summarize the discussion about organizational learning in relation to the research interests of this study, it seems that more thorough understanding is needed in four issues. The first issue is how to achieve and support reflective learning with multiple actors – particularly with users – and how to connect that learning in individual cases to the organizational learning (cf. Dewey, 1910). The second issue is how to pursue expansive learning together with actors outside of the or-

ganizational borders, taking into account that expansive learning focuses on organizational learning inside of an organization (Engeström, 1987). The organizational learning researchers that acknowledge the importance of networked activity have raised this issue, too (Knight, 2002; Knight and Pye, 2005; Toiviainen, 2003; Toiviainen et al., 2009). Engeström himself (2004; 2007; Virkkunen, 2006) states that it would be beneficial to understand more deeply how forward-oriented expansive learning takes places in the context of multiple activity systems.

Third, an issue arises how to promote organizational learning together with users in the context service innovation. This issue has been studied earlier by Hasu (2001) and Hyysalo (2009; Hyysalo and Lehenkari, 2003). They have applied an activity-theoretical approach on learning and analyzed how user-participation can be increased for the purpose of product innovation. Hasu's (2001) study points out the critical role of transition from the innovation developer to the users. This study provides an important starting point for understanding collaborative learning with users, but this examination should be extended to the context of developing service innovations. Fourth, it would be important to study how to support learning in the context of innovation as a strategy-based issue. The link between the learning and organizational strategy could be analyzed in a greater extent than what studies covering learning (e.g. Engeström, 1987; Virkkunen, 2006) have done. If learning is not linked to the strategic aims of the organization, there is a danger that the learning relies too much on individual efforts and is not productive to the organizational goals (Crossan and Berdrow, 2003). To illustrate how learning could be combined to the strategic aims of organizations is explored next.

2.4 Frameworks to foster learning in innovation: a strategy-based approach

Organizational strategy is one of the central issues within strategic management. Hoskisson et al. (1999) have made a literature review in this field and point out Chandler's (1962) 'Strategy and Structure' and Ansoff's (1965) 'Corporate Strategy' as important early developments. According to them, these works were based on a contingency perspective (Burns and Stalker, 1961) and the resource-based view (RBV) of the firm (Penrose, 1959). The contingency perspective highlights a fit between the organization's strategy and its structure and environment as a success factor, while the resource-based view emphasizes the importance of intra-firm resources (Hoskisson et al., 1999).

In the 21st century, continuous environmental change has become the norm for organizations (Morgan, 1997; Tsoukas and Chia, 2002). There is an increasing need to continuously and rapidly adapt to the environment and identify emerging trends. Theoretical discussions about strategies aim to better understand the fit of the organization and its resources to the environment. For example, the concept of dynamic capabilities (Teece et al., 1997) is an advancement of the resource-based view and the perspective of the 'agency-structure relationship in a context' develops the contingency theory further (Child, 1997). The concept of dynamic

capability (Teece et al., 1997) refers to the organizations ability to reconfigure its competences in order to meet the continuously changing environment. It highlights the organization's 'competitive survival' instead of achieving the 'sustainable competitive advantage'. The perspective of the 'agency-structure relationship in a context' (Child, 1997) emphasizes that even though organizations need to adapt to the environment, they also have impact on it. Instead of being contingent on the impersonal variables – such as the size and structure of the organization – organizations can influence their performance by deciding the course of strategic action through human activity and collective learning.

In the field of strategy, there is a strengthened view that the creation and implementation of the strategy is not only the task of the upper management. In the 1990s – in line with the innovation research (sub-chapter 2.2.4) – the strategy literature began to identify the importance of participation and agency of knowledgeable middle managers and employees to the strategy process (Minzberg, 1990; Westley, 1990). It was noticed that these actors are making decisions in their daily activities and their participation to the strategy process was noticed to help to elaborate a common understanding for the future (vision) and to channel actions in the situations of change (Johnson et al., 2003; Kim and Mauborgne, 1999; Miles et al., 1978).

The recent development in the strategy literature emphasizes the need to focus on micro-level phenomena, to those activities and actors that create strategy in practice. The studies following the theory on strategy-as-practice (Johnson et al., 2003; Whittington, 2007) respond to this need. They depict strategy as something multiple actors 'do' instead of something organizations' 'possess.' Strategy is perceived like any other social practice and focus is on actual practices where strategy is created (ibid.). In these studies the interrelatedness of the 'process' and 'content' of strategy becomes visible.

The challenge of strategy-as-practice is how to create knowledge which is simultaneously sensitive and subtle but also generalizable enough. Johnson et al. (2003) encourage researchers to focus on identifying particular units of analysis that can contribute to the knowledge accumulation. They encourage focusing on those 'events and episodes' that are vital for strategy development. These are, for example, the ways in which the tools and techniques of strategy are employed in interaction of individuals and organizational processes in specific contexts.

In this thesis, organizational strategy and its processes are approached as a background factor for innovation and learning, and the perspectives of foresight and evaluation are applied in this context. These perspectives supplement the other theoretical perspectives of this study by providing conceptual tools and frameworks for the examination of the environmental 'landscape' of innovation activities in knowledge-intensive service organizations. Foresight and (developmental) evaluation are useful in this context as they are collaborative processes by their nature. Foresight provides tools which enable people to collaboratively envision future opportunities and development paths. It is, thus, linked to the innovation-oriented thinking and to the front end of innovation. Evaluation makes it possible to discuss about past activities, successful and unsuccessful cases, and plan

actions for future development. In Articles I–III, the model of expansive learning has been combined with frameworks and tools of foresight (Bell, 2003; Phaal et al., 2003) and evaluation (Patton, 1997; 2011). In the next two chapters the theoretical background and concrete ways of utilizing these approaches are opened up.

2.4.1 Collaborative foresight for the future

Foresight represents an application-oriented perspective of futures studies to explore and become aware of the different environmental and social factors that affect and shape possible futures (Phaal et al., 2003). Futures studies are an interdisciplinary field which combines economic and sociological studies, for instance; it also includes studies of strategic decision making and engineering (Irvine and Martin, 1989). A characteristic of foresight is that it includes a strong emphasis on action and in this way comes close to innovation research and practice (Havas et al., 2010; von der Gracht et al., 2010).

The starting point of foresight is that the future is a not a single 'truth out there' but it shows multiple possibilities and development paths which can be affected by the choices and actions of people (Bell, 2003). In other words, the future is created through the actions that people take individually and collectively today (Irvine and Martin, 1989).

Until the late 1980s, predictive forecasting was typically used in organizations to support strategic planning (Cuhls, 2003). Ansoff (1984) was a pioneer in developing methods which did not focus on the most probable state of affairs in the future, but highlighted the significance of uncertainties. His concept of 'weak signals' refers to the first symptoms of strategic discontinuities, i.e. a future development which shows a significant departure from the past or from the smooth extrapolation based on the past (ibid.). Along with the faster development cycles and uncertainties in the organizational environment in the 21st century, it has become increasingly evident that conventional forecasting methods are insufficient (Havas et al., 2010). The foresight approach has become all the more popular: *understanding the current and future social structures, their linkages, and the opportunities and challenges of different kinds of futures has come to the fore*.

Foresight has been noticed to be *beneficial for both policy makers and organizational decision makers*, as it offers frameworks and methods to create future-oriented views on multiple development paths which may occur in the future. It also helps to anticipate the consequences of long-term decisions and to evaluate their desirability, importance, and acceptability (Ahlqvist et al., 2012b; Bell, 2003; Havas et al., 2010; von der Gracht et al., 2010). Widely used foresight methods are, among others, scenario building, roadmapping, trend analysis, and the analysis of weak signals (also called wild cards) (Holopainen and Toivonen, 2012; Irvine and Martin, 1989; Masini, 2003). In the elicitation of futures views, expert-based methods – like expert panels and Delphi surveys – are commonly used. Especially the foresight exercises carried out at the policy level (in regions, sectors etc.) have applied these methods. In the panel method, expert groups in specific issues are collected; each of these 'panels' produces futures intelligence from their own the-

matic field. The Delphi method relies on the anonymous interaction of experts: it includes several survey rounds, between which respondents get feedback from the results of the previous rounds (Hjelt et al., 2001).

Along with the emphasis on the participatory foresight methods and the spread of futures thinking to the organizational level, the expert focus has diminished to some extent. In the presentation of the results of foresight exercises, scenario building and roadmapping have gained popularity (Ahlqvist et al., 2012a, Popper, 2008). Scenarios can be built in two ways: starting from today and anticipating different images for the future, or fixing first the desirable and avoidable futures and analyzing thereafter the respective paths to them (Popper, 2008). *Roadmapping resembles the scenario method, but the way in which the paths are explored is more specific.* The exploration of futures is linked to a specific theme area and a specific environmental context (Phaal et al., 2003). In this way, a focused landscape for innovation activities can be created and different drivers behind the various development paths can be analyzed (ibid.). Hence, roadmapping was selected as the futures methodology in this thesis and was used to understand learning as strategy-based activity in the context of innovation. In the following, it is described in more detail.

Roadmapping is a flexible framework and method to trigger future-oriented thinking and expand people's mental horizons. It is used both among policymakers and in a variety of organizations (Ahlqvist et al., 2012a; Phaal et al., 2003). In the latter context, it has been applied for two different purposes (Ahlqvist et al., 2012a; 2012b). Originally, it was mainly a tool for scanning the technology development (Phaal et al., 2003) to provide guidelines for the product development. This narrow application is increasingly replaced with a framework that supports future-oriented thinking and collaborative strategy creation in organizations (Alhqvist et al., 2012a; Blackwell et al., 2008).

Strategic roadmapping serves the purpose of common formulation and visualization of the strategy and long-term vision. When used for this purpose, a collaborative learning process among managers and employees from multiple departments plays a significant role. This kind of future-oriented process supports the creation of anticipatory agency, i.e. proactive participation that leads to action and innovation capacities which are based on structural openness and collaboration across disciplines (Ahlqvist et al., 2012a; Rohrbeck and Gemuenden, 2011). Figure 5 illustrates the specific roadmapping framework that this thesis has utilized in the analysis of the strategic development of knowledge-intensive service organizations (Articles I–III). The framework was modified on the basis of the model by Phaal et al. (2003) in the initial phase of the study reported in Article I.

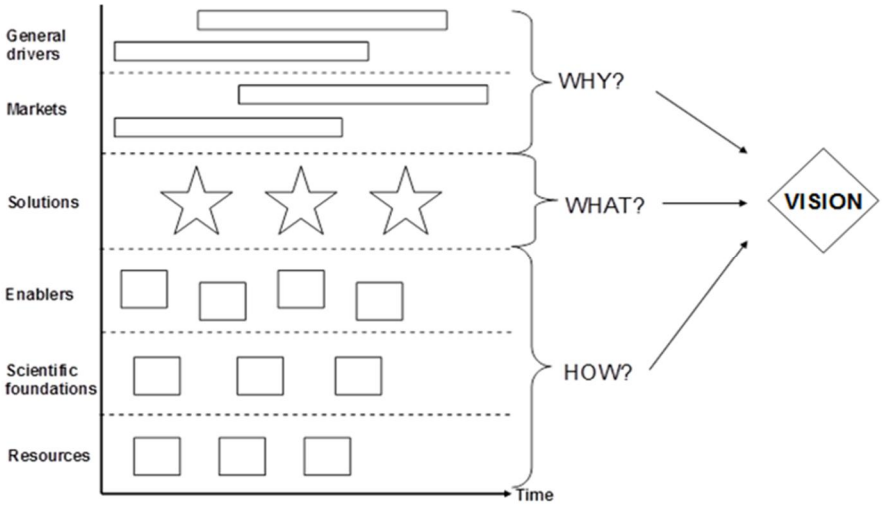

Figure 5. A strategic roadmapping framework as a conceptual tool for future exploration (modified from Phaal et al., 2003).

Using the framework illustrated in Figure 5, the roadmapping work starts from the collective mapping of the drivers of service development; these include both general drivers and the drivers coming from the markets (answers to the 'why' questions). Second, the available resources and enablers as well as the scientific foundations of development have to be explored (answers to the 'how' questions). Finally, the necessary changes that will lead to new solutions should be collaboratively brainstormed (answers to the 'what' questions). Together, these endeavors link the present to a shared vision of the long-term future (Phaal et al., 2003). Both the pull factors (drivers) and the push factors (enablers) are taken into account in service innovation. The collective exploration of the strategic development directions creates a learning situation. The process and results of this collective effort are dependent on the people who participate in the foresight process. The ways in which employees, users, and managers can be engaged in strategic and innovation oriented roadmapping is described in the results part of this thesis.

2.4.2 Towards collective learning through evaluation

Evaluation is another tool in strategic management; its purpose is to provide managers with feedback from the activities that they have initiated and supported. Commitment to the systematic evaluation of social programs became common in education and public health in the beginning of 20th century (Rossi et al., 2004). Publicly funded research and development programs have been evaluated since the 1960s. In organizations, evaluations have been typically used to assess

whether the organization or some specific project within it has fulfilled its pre-set goals (Coryn et al., 2007).

Traditionally, evaluation has produced information for the decision makers, owners, and top managers in a measurable shape. Quantitative data and outputs in the form of quantitative indicators have been typical. In the scientific context, the number of patents or scientific articles has been the concrete application of this practice (Rogers, 2008). The motive for evaluation has been to legitimize the stakeholders' money utilized and to adjust the inputs if necessary (Coryn et al., 2007).

The above-described trend in evaluation reflects the positivistic paradigm. Since the 1990s, the general development of an alternative – the constructivist paradigm (Guba and Lincoln, 1989; Patton, 1997) – has questioned 'one truth' in the field of evaluation, too. A view which perceives evaluation as a tool to create common understanding among the evaluated ones is gaining ground. An emerging trend is to utilize evaluation for the purpose of organizational development and collective learning. Various approaches of participatory, developmental, and empowering evaluation have highlighted the possibility of combining evaluation and learning via the engagement of the persons whose activities are evaluated (Dart and Davies, 2003; Fetterman, 2001; Friedman, 2001; Garaway, 1995; Patton, 1994, 1997; Torres and Preskill, 2001). The engagement must include stakeholders in and outside organizations and it must concern the entire evaluation process: problem formulation, data collection, analysis, interpretation, and the formulation of recommendations. The collective evaluation process itself is actually more important than the written report created by external evaluators.

Based on the above-described views, this thesis applies the view of developmental evaluation, following the definition of Patton (2011). According to him, *developmental evaluation is 'the process that supports learning to inform action that makes a difference in the ones evaluated'* (ibid., p. 11). The purpose of this kind of evaluation is to foster innovation, which means changes in the current activity systems and involves a deeper understanding of what is happening in the environment. Hence, developmental evaluation sets a new challenge to the evaluators: their role is changed from a judge towards a facilitator of collective learning (Patton, 2011; Torres and Preskill, 2001).

Despite an interest towards collective learning in the context of evaluation, a stronger integration with the organizational learning theories would be beneficial. The evaluation approaches that highlight organizational learning as an explicit goal have usually been based on the theory of action learning by Argyris and Schön (1978) (see Patton, 2011). A need for deeper integration concerns particularly the issue how to take steps of transformational learning for the future, i.e. how to direct the activity towards innovations (Saari et al., 2008). In the evaluation approaches, learning should be supported via continuous feedback to the participants in order to enable changes in the activity during the process. In addition, it is important to pay attention – not only to the tools and specific processes – but to the change of activities after the evaluation situation is over (ibid.).

In order to understand more concretely how to utilize developmental evaluation as a tool for collective, transformational learning and agency, we accomplished two empirical studies (Articles I–II). We integrated evaluation of the past activity to the expansive learning theory. In this way, we extended evaluation to cover the process for future learning which includes radical qualitative changes in an activity (exploration – cf. March, 1991). The empirical part of this thesis analyzes to which extent the process triggered expansion in the object of activity and how users were engaged in the learning situation.

2.5 Summary of the theoretical analysis and research gaps

2.5.1 Summary of the theoretical perspectives

This thesis focuses on the topic of learning with users in innovation activities of knowledge-intensive service organizations. It combines the strategic and practical views on innovation and learning. In order to create a firm basis for the research task, the topic has been discussed theoretically from four perspectives based on the respective literature (Figure 1). The first perspective includes collaborative innovation processes with users and has the theories of innovation (and more specifically service innovation) as its background. In the second perspective, expansive learning forms the core. The third perspective analyzes learning in innovation as a strategy-based issue. Within the vast topic of strategic management, foresight and evaluation have been selected as conceptual tools and frameworks in this thesis; they enable the analysis of the environmental 'landscape' of innovation activities. The fourth perspective concerns the empirical context – knowledge-intensive organizations as service innovators. Their characteristics were discussed in the introductory chapter and will be supplemented in the description of the empirical research.

In the field of *(service) innovation – the first perspective of this thesis* – multidisciplinary views are gaining ground. These views highlight understanding the mechanisms of innovations among actors in and between organizations (Crossan and Apaydin, 2010; Gallouj and Djellal, 2010; Sundbo and Toivonen, 2011). The development of general innovation research (Lemola, 2002; Lundvall, 1992) has essentially contributed to the development of research into service innovation (Gallouj and Djellal, 2010; Sundbo, 1996). General innovation theories have brought to the fore the significance non-technological innovations and the non-linear nature of innovation processes. They have placed collaborative learning and everyday activity at the center of innovation, but have not elaborated the learning processes in more detail (Lemola, 2002; Lundvall, 1992; Lundvall and Johnsson, 1994).

Service-specific theories (Edvardsson and Olsson, 1996, Sundbo, 1997) and the theories on value co-creation (Vargo and Lusch, 2008; Vargo, 2013) have benefited service innovation research by clarifying the nature of service(s). Services are characterized as intangible, process-based products whose production

often includes the participation of users – a phenomenon called 'co-production' (Sundbo and Gallouj, 2000). Edvardsson and Olsson (1996) have developed a model in which a service is described as an entity consisting of three interlinked components: the service concept, the service process, and the service system. Renewal in one or several components can act as a locus of innovation. Edvardsson and Olsson (ibid.), like many other authors of service-specific theories, represent the service marketing school, which traditionally has not used innovation terminology but applied the terminology developed in the framework of New Service Development (NSD).

Service-dominant logic (SDL) is a theory based on the concept of value co-creation (Vargo and Lusch, 2004; 2008). It points out that value is not 'inside' a service, but it is uniquely experienced depending on the user need, context, and the use situation. Because an individual service has to be linked to other services in order to be beneficial, the user is always a co-creator of value. This postulate has influenced significantly the understanding of service innovation as a collaborative activity (Grönroos, 2006; Vargo and Lusch 2004; 2008; Vargo, 2013). Suitable human capabilities, interactions and dialogical relationships are emphasized here (Ballantyne and Varey 2006; Edvardsson and Tronvol, 2013; Lusch et al., 2010). However, SDL scholars have not yet extended the view on the active role of users to the process of co-development and learning in service organizations. To some extent, this is done in the context of practice-based studies on service innovation. These studies have highlighted that *the core of service innovation may be the collaborative process itself* (Russo-Spena and Mele, 2012) – a view which is very important from the viewpoint of this thesis.

The role of users in innovation is linked to the classic studies of von Hippel (1986; 1988; von Hippel and Oliveira, 2011). In particular, these studies have provided understanding about lead-users as innovators. Later on, other studies have depicted that also ordinary users can be active innovators (e.g. Sundbo and Toivonen, 2011). Regarding the nature of the innovation process, two different models can be separated: a systematically progressing process and a process whose core is experimenting with the users. In the former model, provider-centric views have dominated the discussion but there are also suggestions for variants in which user feedback is acquired in different stages of the process (Alam, 2002; Alam and Perry, 2002). A benefit of the systematic approach (particularly if users are taken into account) is that the clear structure supports the progress of the process.

The models focusing on the systematic process have often been called 'stage-gate-models' because 'go-kill' decisions take turns in them (Cooper and de Brentani, 1991). These models have been applied in both product and service contexts; in the service context, the NSD school has been the main applier of this approach. Critique against it has concerned the slowness and the universal view on the nature of development (Engwall, 2001; Toivonen, 2010; Strandvik et al., 2012). The newest NSD studies (Gottfridsson, 2010; 2012; Matthing et al. 2004) have tackled these challenges and adopted approaches that better take into account the dynamic nature of collaboration and the context of innovation. These

studies have pointed out that *service development resembles collective and iterative learning activity* (ibid.).

Experiential views on innovation have aroused increasing interest as an alternative to stage-gate models (Crossan and Apaydin, 2010; Engwall et al., 2001). These views have emerged among two groups of scholars: the first group represents a practice-based approach to learning (Dougherthy, 2004; Ellström, 2010; Orlikowski, 2002), and the second group a practice-based approach to service innovation (Baker and Nelson, 2005; Fuglsang, 2010; Fuglsang and Sørensen, 2011). The learning studies have argued that practice-based 'knowing' and situated learning are able to generate innovations (Ellström, 2010; Orlikowski, 2002). The service innovation research has utilized the anthropology-derived concept of 'bricolage' in this context (Baker and Nelson, 2005; Fuglsang and Sørensen, 2011). This concept describes the emergence of innovations in a situation in which scarce resources compel the actors to make solutions based on 'what is at hand'. This mundane problem-solving is common in employee-driven innovation that emerges at the customer interface (ibid.).

The second perspective of the thesis is based on the need for more theoretical and empirical knowledge about the concrete actions, activities, and mechanisms that enable the transformation and bridging of the ideas emerging at the grassroots level into recurrent and officially recognized activity patterns in organizations. Turning ideas to a higher abstraction level and to a collective activity are near to change and development in an activity (Fuglsang and Sørensen, 2011). This study suggests that in-depth understanding about the above-mentioned processes can be found from the theories of *organizational learning*. The topic of organizational learning is, however, vast and it is theorized in multiple ways. In this thesis, *the focus is on those learning theories that are most directly linked to innovation*. This means the selection of the theories that explain how discontinuous and transformational development steps in cognition and in socio-cultural activity could be taken in order to create seeds for innovations. The theories of expansive learning (Engeström, 1987; 2004; 2007) and reflective thought and action (Dewey 1910; Miettinen, 2000) have been found to be most compatible with the research interests of this study.

The theory of expansive learning (Engeström, 1987; 2004; 2007) discusses organizational learning at the levels of community and activity. The question is of a dynamic, transformative learning which takes place through expansive shifts in the object of activity. The theory endorses the idea that a renewal of an everyday activity may serve as the seed for an innovation when people learn something that does not exist yet. Because insights and innovative ideas are made by individuals – not by the organization – they need to be interpreted, refined, and shared in a community in order to become novel, collaborative concepts of activity and to foster the emergence of organizational learning (cf. Crossan et al., 1999). Thus, expansive learning requires conceptual and strategic learning (cf. Dodgson, 1991) – learning at the level which the organizational learning scholars have been particularly interested in (Crossan et al., 1999; Crossan and Berdrow, 2003). The theory of expansive learning also creates a model for the organizational learning

process. This process is based on a systemic view, it combines cognition and action, and it includes exploration and exploitation of the activity and its contradictions (Engeström, 1987). An expansive organizational learning process can take place on its own, but it benefits from the support of facilitative actors and learning interventions (Engeström, 2004; Lounsbury and Crumley, 2007).

A 'co-configuration' setting is the most recent form of applying expansive learning (Engeström, 2004; 2007). It highlights the active user involvement and collaboration in activity systems. It also brings to the fore shared problem-solving activities, practice-based experiments, and 'learning by doing' between multiple actors (ibid.). To understand these issues in more detail and to uncover the mechanisms of learning as concrete steps, the scholars of expansive learning (Miettinen, 2000) have utilized the ideas presented in the classical learning theory by Dewey (1910; 1938). Also this thesis applies the theory of expansive learning supplemented with the ideas of Dewey.

Dewey's (1910; 1938) theory on reflective thought and action highlights the active and reflective role of the learner in the practical problem-solving process. It argues that habits create the dominant form of human experience, and to change a habit, an investigation of the broader conditions of the situation is needed. This calls for reflection and creation of a 'working hypothesis' which can be tested in practical action by experimenting. If people become aware of their observations made in practice, they can transform these observations and turn them into enriched thought and action (Dewey, 1910; Miettinen, 2000). The relationship between an actor's experiences and their reflection is the core in the learning process (Dewey, 1910).

Dewey (1910; 1938) discusses learning at the same level as practice-based service innovation studies (Fuglsang and Sørensen, 2011) and the most recent theories representing New Service Development literature (Gottfridsson, 2010; 2012). Like Dewey (1910), these approaches highlight the importance of participation, practical problem-solving, and experimenting. However, Dewey's theorizing (ibid.) opens up the mechanisms of learning in more detail and in this way contributes to the analysis of innovation especially at the practice-level of organizational activity. The point that separates Dewey's (ibid.) ideas from pure trial-and-error learning, and is similar to the views of expansive learning, is the emphasis on reflection: experiences should be evaluated against more general and conceptual criteria (Dewey, 1910; Miettinen, 2000). This is a common point with service innovation studies, too. Sundbo and Fuglsang (2002) suggest that the evaluation criteria should be derived from the organizational strategy or from the user needs and topical questions in the environment.

The third perspective strengthens the analysis of organizational learning as *strategy-based innovation activity*. For this purpose, frameworks and conceptual tools from *foresight* (Phaal et al., 2003) *and developmental evaluation* are presented (Patton, 1997; 2011). These frameworks and tools indicate that formulation of the strategy and vision should be based on multiple voices across organizational borders and take place in a collaborative manner (cf. Minzberg 1990; Westley, 1990). The realization of this practice requires dialogue between various actors

and can be supported with roadmapping (Ahlqvist et al., 2012a; Phaal et al., 2003) and developmental evaluation (Patton, 2011) tools. These tools enable the analysis of the environmental landscape of the activity as well as the shortcomings of the past activity. The results of these analyses are dependent on the people who participate in the processes. The ways in which employees, users, and managers can be engaged in strategic processes are described in the results part of this thesis.

2.5.2 Combining the views on service innovation and learning and identifying research gaps

The interest of this thesis is to study how learning with users can take place in innovation activities of knowledge-intensive organizations. The previous chapters, which have discussed the theoretical perspectives of the thesis, have shown that the interaction between top-down and bottom-up approaches (simplifying, between the strategy and practice) is of utmost importance to the emergence of innovations. However, in the limits of this thesis, studying this interaction as a whole has not been possible empirically. The empirical examination has been focused on the level of practical processes, which means that the core in it has been service innovation and organizational learning. The broader perspective of strategy has, however, been taken into account as an issue to which innovation and learning are linked.

Table 1 summarizes the contribution of service innovation approaches to the understanding of collaborative learning with users in innovation activities. Due to the large amount of available literature, only the research streams that are most relevant from the viewpoint of this thesis have been included. They are: SDL-based theory on value co-creation, the most recent theories in the framework of New Service Development, and practice-based theories on situated learning and service innovation. All of them show a shift from the sequential and service provider-centered innovation models towards the understanding of complex social processes that take place in interaction, learning, and experimentation with multiple actors in- and outside organizations. They also emphasize users as important sources and partners in innovation, and highlight that users can provide valuable inputs for the providing organizations if their agency and creative potential is appreciated and fostered.

In Table 1, each research stream is considered in more detail from the viewpoint of learning, on the one hand, and from the viewpoint of user orientation, on the other. In addition to their contribution, also the issues neglected or discussed only in passing are identified as a preparation for the definition of the research gaps that this thesis aims to tackle.

Table 1. Learning and users as topics in the selected approaches to service innovation.

Approach to service innovation	Connection to the perspective of learning	Connection to the perspective of user orientation
SDL-based theory on value co-creation (Ballantyne and Varey, 2006; Edvardsson and Tronvol, 2013; Lusch et al., 2010; Vargo and Lusch, 2004; 2008)	The theory acknowledges the importance of learning by emphasizing the collaborative nature of service innovation, suitable human capabilities, and dialogical relationships. However, the analysis is at quite a general level.	User is seen an active actor in the value co-creation and co-development of novelties. However, the ways in which this active role can be achieved is not opened up. Accordingly, the ways of learning in the provider organization remain open.
Most recent theories in the framework of New Service Development (Gottfridsson, 2010; 2012; Matthing et al. 2004)	The theories consider new service development as an iterative process which resembles collaborative learning. However, the learning that takes place in individual processes is not integrated to the broader organizational dynamics and organizational learning.	User is seen as an active actor in the service development. However, but the participation is rather one- dimensional, organized for the benefit of the service provider.
Practice-based theories on situated learning (Dougherthy, 2004; Ellström, 2010; Nicolini et al., 2003; Orlikowski, 2002) and practice-based theories on service innovation (Baker and Nelson, 2005; Fuglsang, 2010; Fuglsang and Sørensen, 2011)	In these theories, practical problem-solving and context-based 'learning by doing' are considered important in the generation of service innovations. However, the linkage of situated learning to the strategy-based issues of organizations has not been investigated in detail.	User is implicitly seen as an active actor. However, the ways in which users innovate have not been a focus. In service innovation theories, this is partially due to the strong emphasis on employees as innovators (e.g. the approach of bricolage). Thus, the promotion of users' innovative role needs further research in this context.

Corresponding to the summary of the selected approaches on service innovation, Table 2 summarizes the learning theories selected for particular consideration in this thesis. Both the contributions and weak points of these theories are presented. The table compares the theory of expansive learning (Engeström, 1987) and the theory of reflective thought and action (Dewey, 1910) from the perspectives of innovation and user orientation. Both theories contribute to explaining how learning can generate discontinuous changes in an activity, if it includes changes in the cognition and action of the learner. The main difference is that the learning con-

cept of Dewey (1910) focuses on the practice level, whereas the concept of Engeström (1987) conceptualizes learning at the organizational level. Expansive learning could be used for the purpose of triggering innovation in an organization if the process includes both employees and managers, and includes a strategic orientation towards the environment. This view bridges the theory of expansive learning with the theories of employee- and user-based service innovation and of innovation as strategic reflexivity (Sundbo and Fuglsang, 2002; Sundbo and Toivonen, 2011).

Table 2. Innovation and users as topics in the selected theories of organizational learning.

Learning theory	Connection to the perspective of innovation	Connection to the perspective of user orientation
Expansive learning (Engeström, 1987; 2001; 2004)	The theory argues that a qualitative renewal of an everyday activity may serve as the foundation for an innovation. The concept of 'expansion' includes the idea that 'expansive shifts and transformation' are possible as a result of learning. The theory gives structure and tools to conceptualize organizational learning as a process which combines action and behavior as well as exploitation and exploration. However, the view on expansive learning as a strategy-based issue needs more understanding.	The theory describes the overall importance of broad participation in learning. However, it does not open up how the actors outside the organization, such as users, could be involved in the process.
Reflective thought and action (Dewey, 1910; 1938; Miettinen, 2000)	The theory considers that learning takes place if there is a change both in the cognition and action of the learner. Practical and contextual experiences can generate a qualitative change (a seed for innovation) if they are reflected against more general evaluation criteria. However, the ways in which this kind of experiential and reflective learning could be combined to the organizational learning is not discussed.	The theory describes the importance of active participation in the problem-solving. However, it does not open up how the actors outside the organization, such as users, could be involved in this kind of problem-solving.

Next, the research gaps are crystallized into two issues, one of which concerns service innovation studies and the other learning studies. As regards the studies on service innovation, the gap concerns the processes, dynamics and triggers in

collaborative learning and the integration of individual learning processes into the organizational learning. The importance of collaborative learning has been highlighted, but it has remained unclear how learning could be promoted as a way to consciously enhance service innovations in organizations together with users (Crossan and Berdrow, 2003; Greer and Lei, 2012). Much attention has been paid to the social and collaborative work activities as venues for innovation (e.g. Lundvall and Johnson, 1994; Schienstock, 1999). However, the studies have not revealed the steps that emerge in the 'learning by doing' processes: how the activity evolves with users. In addition, the linkages of the practice-based problem-solving to the broader organizational learning as a strategy-based issue are weak.

User-based service innovation literature has recognized this problem and made efforts to create a link between strategy and practice. The concept of 'strategic reflexivity' by Sundbo and Fuglsang (2002; Fuglsang and Sundbo, 2005) emphasizes that the problem of not perceiving the ideas and collaboration emerging at the grassroots level as strategically important could be overcome. It requires that the organizational environment, organizational structures, and collaboration among individual actors foster a strategic and reflexive stance. The management system and management practices should facilitate the employees' creativity and collaboration with users, and integrate the results of this creativity and collaboration into the officially recognized way of working in the organization (Saari et al., 2015; Sundbo and Fuglsang, 2002; Sørensen et al., 2013). This means that the organizational support system (managerial activities) should simultaneously enhance the innovation climate and make the various innovation impulses to meet each other. However, the realization of the above-described combination (strategic reflexivity), and learning associated with it, needs further research. Thus, the first research gap can be formulated as follows:

In service innovation studies, the user is seen as an active actor in value co-creation and in the development of novelties, but understanding the collaborative learning mechanisms is deficient and the linkages of individual innovation processes to the organization level strategic issues are weak.

Despite many benefits that the examined organizational learning theories (Dewey, 1910; Engeström, 1987; 2001) provide, there is still limited understanding about how learning with users actually takes place and how the agency of users can be promoted for the purpose of service innovation. Both above-mentioned theories focused on (Dewey, 1910; Engeström, 1987) describe the importance of participation in general terms, but do not focus on the issue of how users could be involved in the learning process. Also the views on organizational learning as a strategy-based issue need more understanding. In this sense, the theories of service innovation are more concrete (even though they, too, include deficiencies as described above). The second research gap can be formulated as follows:

Organizational learning theories based on the ideas of expansion and reflection contribute to the analysis of innovation in terms of practical problem-solving and conceptual insights, but linkages to the role of users and to strategy-based issues should be created in the context of service innovation.

Summarizing, the theoretical analyses and research gaps justify that it is topical to study in more detail how learning with users takes place in service innovation activities as practical and strategy-based activity. Particularly beneficial would be empirical studies that provide understanding about the concrete actions, activities, and mechanisms of learning in the innovation context. This thesis contributes to the fulfillment of this need by carrying out four empirical studies in knowledge-intensive service organizations.

3. Research questions, research approach and methodology

3.1 Research questions

In the literature summary, a research gap was identified in both of the theoretical frameworks that form the core of this thesis. The first gap concerns service innovation studies that do not describe in detail the mechanisms of the collaborative learning with users. The second gap concerns the studies on organizational learning, in which the creation of collaborative learning processes with users has not been examined in the context of service innovation. In addition, understanding the role of organizational strategy in relation to innovation and learning should be strengthened. To bridge the studies on service innovation and organizational learning in the context of this thesis – knowledge-intensive service organizations – the following research question has been formulated:

How can innovation activities in knowledge-intensive service organizations be understood as collaborative learning which involves a strengthening user-agency, and what are the learning challenges in the adoption of this perspective in a sustainable manner?

The more detailed research questions are:

1. *How to include and utilize 'the voice of users' in perceiving the service organization's future change needs?* (Article I)
2. *How to include and utilize 'the voice of users' in questioning and analyzing the service organization's past activity?* (Article II)
3. *How to engage users as active actors in the creation of new activity in the service organization?* (Article III)
4. *How to promote the agency of users as service innovators?* (Article IV)

These four questions are explored and answered in Articles I–IV of the thesis, respectively. All articles include case studies in Finnish knowledge-intensive service organizations or knowledge-intensive departments of broader organizations.

The user-agency and collaboration with users deepens step by step from the first to the fourth article. Article I focuses on a research organization which has developed a novel user-driven research strategy and built a network to support it. The case study in this context analyzes the managements' and researchers' learning efforts linked to the renewal. The study reported in Article II was conducted in another research organization. Here, the collaborative learning efforts with users are examined in questioning the past activities. An intra-organizational, horizontal research program was developed in this case, covering multiple organizational units. Article III focuses on collaborative learning in an information technology (IT) company, which broadened its service to management consultancy. The case study concerned collaboration with users in the public sector, and the partnership-type engagement of users in innovation was the core of novelty. Article IV deals with different kinds of service innovation efforts of two cities. The development departments of these cities promoted the involvement and empowerment of users as service innovators, but the approaches differed regarding the emphasis on planning vs. experimentation.

3.2 Research approach

Research approach refers to the way in which a study is built and the procedures carried out in order to provide new knowledge on the research topic. A suitable research approach is based on *the nature of the research problem* and the construction of the research questions. In this thesis, the research problem is to create more understanding of 'how' innovation activities in knowledge-intensive service organizations can be understood as collaborative learning which involves a strengthening user-agency. Hence, the aim is to understand and describe a complex social phenomenon in a real life context, rather than to describe the quantity and characteristics of the outcomes. For this purpose, a qualitative research approach is suggested to be the most suitable (Bryman and Bell, 2011; Yin, 1994).

The research approach also reflects the broader background assumptions of a study. These assumptions concern ontology – what is regarded as appropriate knowledge about the reality – and epistemology – how this knowledge can be created (Bryman and Bell, 2011). In short, they describe respectively 'what we know and how we know' (Burrell and Morgan, 1985). The epistemology of a study depicts how theory and knowledge are formed, where knowledge is acquired, what kinds of criteria are used, and what kinds of constraints are included (Bryman and Bell, 2011; Eriksson and Kovalainen, 2008).

The ontological assumptions of this thesis are based on a *socio-constructivist paradigm*. This paradigm emphasizes the socially constructed nature of reality and the importance of collaboration and negotiation in knowing and learning (Edvardsson and Tronvol, 2013; Gherardi, 2008; Tronvoll et al., 2011). It challenges the ideas of 'objective, independent existence' by stating that existence in the world is complex and not beyond our influence; it is in a constant state of change and revision (Bryman and Bell, 2011; Eriksson and Kovalainen, 2008). This paradigm

recognizes that a certain physical/material world exists and artefacts can embody knowledge, but they cannot be known in one single way. Rather, they get their meaning via the social interaction in a world where there are multiple perspectives that can be negotiated and constructed (Gherardi, 2008). Human experience is seen to generate the understanding of what works, what doesn't work, and what should be changed in practice (Dewey, 1910).

The epistemological approach in this thesis is *abductive reasoning* (Dubois and Gadde, 2002; Järvensivu and Törnroos, 2010; Paavola and Hakkarainen, 2005). Here, the research questions and conceptual issues are answered in a cyclical interplay between the theory and empirical findings. The abductive approach is about the process of discovery via the interaction of theory and practice, and of the researcher and the research objects (Dubois and Gadde, 2002). It has gained popularity because the creation of novel understanding in social sciences is complex and the current research phenomena are not satisfactorily explained by pure deductive or inductive processes (Van de Ven, 2000). In addition, it is common that there are not only theoretical but also practical and developmental demands that need to be satisfied simultaneously (ibid.).

The abductive reasoning process of this study was applied both in each case study reported in Articles I–IV, and in the cumulative and cyclical process which combines the findings of this thesis. In the latter process, the research results were integrated into a holistic understanding of the examined phenomena, and this understanding was used to elaborate the theoretical views adopted. The abductive reasoning process of this thesis is demonstrated in Figure 6.

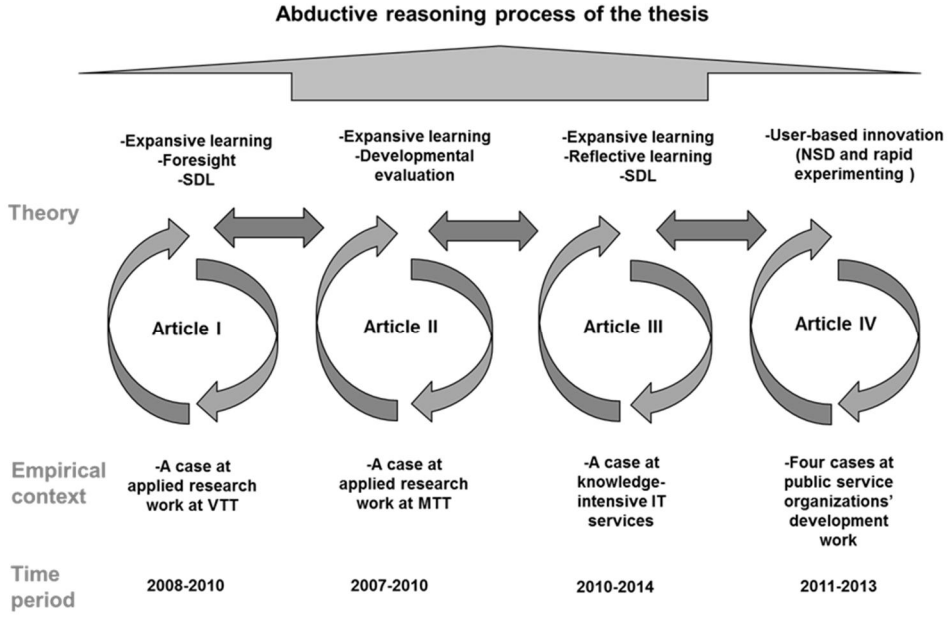

Figure 6. The abductive reasoning process of this thesis (based on Järvensivu and Törnroos, 2010).

The first study was carried out during 2007–2010 (described in Article II). It combines the theories of expansive learning (Engeström, 1987) and developmental evaluation (Patton, 2004; 2007). The empirical study focused on learning from the past activity together with the users. It pointed out, that learning needs to be connected to the future exploration, not only to the exploitation of the past activity. Based on this finding, we integrated the theory of expansive learning (Engeström, 1987) to the frameworks of foresight (Phaal et al., 2003). The second empirical case study during 2008–2010 validated our insight that this integration is beneficial (Article I). *The progress of the reasoning cycle deviates from the time order of carrying out the studies*: the study included in Article II is precedes the study included in Article I. This is because we noticed in the second case study that foresight should actually be conducted before the analysis of the past action. Foresight opens up the environmental landscape for innovation activities, and thus provides such a lens for the analysis of the triggers for innovation and change.

In 2010, when we started our third case study, the theoretical discussion on service-dominant logic (SDL) (Vargo and Lusch, 2008) had gained ground. It highlights the active role of users in the value co-creation, and the social processes involved in the collaboration between the service provider and the user. This discussion seemed to include an implicit link to the phenomena of learning, but

empirical and theoretical studies focusing on this link were not yet conducted. Thus, our third case study (reported in Article III) examined how the basic postulates of SDL would benefit the analysis of organizational learning. Based on the empirical findings, we modified our emerging model on expansive learning to better take into account the active role of users in the process. The last case study, carried out in 2011 and reported in Article IV, was motivated by the aim to complement the learning cycle by understanding in more detail the various innovation processes in which users are actively involved. The development of theoretical discussions in user-based service innovation supported this aim (e.g. Sundbo and Toivonen, 2011). Thus, Article IV describes the different roles of users in service innovation practices on the activity level. It compares the role of users in two kinds of service innovation processes: planning-based and experiential processes.

The abductive process enabled a gradually deepening understanding of the dynamics of those learning activities that aim at strengthening user-agency in the service innovation context. This understanding is one of the central results of the abductive reasoning process of the thesis, and each case produced elements to its accumulation. Our experience of that process confirms the notion of previous organizational learning (e.g. Engeström et al., 2014) and service innovation studies (e.g. Sørensen et al., 2010) that the examination of evolving complex, sociocultural processes in a context requires the respective research methods, i.e. interactive methods that follow those process in time (Dubois and Gadde, 2002; Paavola and Hakkarainen, 2005; Tronvoll et al., 2011).

The empirical part of this thesis is based on the principles and data gathering methods of *action research* (Argyris et al., 1985; Lewin, 1946; Stringer, 1996). Action research is typically used to reveal conditions and effects of social activity in organizational change and development (ibid.). Like socio-constructivist paradigm in general, this type of research deviates from the positivistic approach – strict deductive procedures concerning the objective reality and deriving from the ideal of natural sciences (see Bryman and Bell, 2011). According to the epistemological assumptions of action research, observation is not enough when the finding of opportunities for development, change and agency in organizations is pursued. Enabling these phenomena requires that activities are sensitively, deliberatively, and collectively created and supported in the interplay of conceptual knowledge and practice (ibid.). Via the participation in a change, researchers gain insights about the prerequisites of the development. In this thesis, this idea is applied for the acquisition of insights about the meaning and effects of user involvement in service innovation activity.

Previous (service) innovation studies in social sciences (e.g. Sørensen et al., 2010) have applied a research approach and method that are rather similar to action research. Those scholars (ibid.) argue experiment as a method to hold potential in revealing the dynamics of complex social issues. The scholars specify that a 'qualitative natural experiment' is suitable to situations in which the aim is to reveal the real-life dynamics of social processes. Laboratory experiments, in turn, reveal inadequately that dynamic because social activity is rooted in contextual

and situational factors. Exploratory and practically applicable knowledge is suggested to be gained best via the real life participation.

In organization (learning) studies, an approach and a learning method which has similar elements of 'qualitative natural experiment' (Søresen et al., 2010) and action research is *action learning* (Revans, 1982). However, action learning focuses on solving real problems at work and in organizations and is a suitable method to provide in-depth understanding of a changing practice (Coghlan and Brannick, 2001; Marquardt et al., 2009; Revans, 1982). In action learning groups, called 'learning sets', participants select issues to be examined, make plans for them, take action and reflect on that action (Coghlan and Brannick, 2001). Action learning is partially similar to the approach of expansive learning (Engeström, 1987), and in this thesis, it is applied by the means of expansive learning (ibid.). The process of expansive learning is also used as an analytical framework to describe and analyze the learning activities with users (Articles I–IV). The similarities and differences of expansive learning and action learning are considered in the next chapter.

3.3 Application of the framework of expansive learning

3.3.1 Justifying the selection of expansive learning as the methodological approach

In this thesis, the theory of expansive learning (Engeström, 1987; 2004; 2007) is applied – not only as a central theoretical framework – but also as framework which influences the way in which the empirical study is carried out. A starting point is that learning and innovation are local, contextual processes of change and development (Gherardi, 2008; Orlikowski, 2002). This means that they should not be treated as atemporal entities, something to be possessed and managed independently. In the methodological sense, the theory of expansive learning (Engeström, 1987) has similarities to the theory of action learning (Marquardt et al., 2009; Revans, 1982). Both suggest that the targets of development should be discussed together with the participants of the research, in a multi-voiced group and in real life situations. Both also highlight that the learning processes can take place on their own, but they benefit from the support of facilitating actors and interventions – for instance, their dynamics are discovered better in this way (Engeström et al., 1996; 2014). The facilitators of the processes are often developmental researchers who simultaneously gain insights about reality: what works and what does not work.

The theory on expansive learning also provides additional viewpoints compared to the viewpoints of action learning (Marquardt et al., 2009; Revans, 1982). It suggests that *the object of activity should be conceptualized as part of a broader historical development phase* and the learning process should be started by making sense of the future development needs (Engeström, 1987; 2004). The theory provides a concrete frame of reference and learning steps for the process of creat-

ing something new that does not yet exist (Engeström, 1987; 2004; Paavola et al., 2004). It also has two more specific aims. First, it aims at *expanding the actual object of activity* through the collaborative process of questioning; this transformation can turn out to be an innovation (Engeström, 1987). Second, it aims at collaboratively creating a learning process and structure for the organization which *can be sustained after the facilitators leave*. In this way, expansive learning fosters the organizational process of 'learning how to learn' (Engeström, 1987; Engeström et al., 2014).

These background assumptions were followed in this thesis. The formulation of the research problems was made on the basis of a close theory-practice interaction, and also the conduct of the empirical study and the analysis of its results were firmly based on theory (cf. the abductive process described above). The role of the researchers was collaborative and participatory. The phenomena to be studied were identified, and the detailed steps of the process constructed, together with the actors involved in the learning and innovation activities. Hence, both the researchers and the informants actively took part in the research process. The researchers were not passive observers, but co-developers offering conceptual knowledge to the practical efforts.

More specifically, in the cases reported in Articles I and II, the researchers acted as facilitators and helped the organizations to collectively create understanding of the need for change and analyzing the past activity together with users. In the case described in Article III, the researchers facilitated the development of the internal learning cycle in the organization, but the representatives of the organization took a facilitative role in involving their users in the creation of new activity. In the case included in Article IV, the organizations themselves introduced novel internal and external practices to empower and facilitate users in innovation.

3.3.2 Reasoning process

The concrete form to utilize the theory of expansive learning in this thesis is the application of *the cycle of expansive learning (Engeström, 1987) as a model in the description and analysis of the examined learning efforts with users* (Articles I–IV). The cycle of expansive learning consists of a multi-level and multi-phased process of creating and implementing a qualitatively new way of working in an organization (expansion and the respective changes). This learning process is not straightforward, progressing linearly with certain phases in time, but the phases and steps take place in a cycle: they are interlinked and the development goes back and forth (Engeström, 1987; Virkkunen and Ahonen, 2011). The process can be used in practice to push expansive transformations forward in organizations. Simultaneously, it offers the possibility for researchers to examine the innovation activities from participatory and process-oriented perspectives (Engeström, 1987; Engeström et al., 2014; Lounsbury and Crumley, 2007).

The five phases of the expansive learning cycle (Engeström, 1987) were described in sub-chapter 2.3.1. They consist of identification the primary contradiction, analysis of the change required in the activity system to solve the contradic-

tion, an expanded object of activity and re-modeling the activity system, an application in which the ideas are transformed into activity, and consolidation of the new concept of activity through reflection and generalization. In this thesis, minor modifications and rewordings were made to these phases to clarify the purpose. The phases were named as *the need for change, questioning phase, creating a new model, testing and implementing the new model, and spreading and consolidating.* The first phase focuses on creating a collective understanding of the need for change as a motive and direction for the change. The second phase includes analyzing and making visible the contradictions of the past activity in order to enable its questioning. In the third phase, a new model of activity is created; it includes suggestions for the expansion of the object and takes the form of both conceptual and practical solutions. In the fourth phase, testing and implementing the model of activity is accomplished; the model is applied and developed further by experimenting it in real life work situations. In the fifth phase, the new model is spread and consolidated in the organization. After the whole cycle has taken place, a new cycle starts and spreads to other activity systems. In Figure 7, the four research questions (discussed in Articles I–IV) are combined with the expansive learning cycle as perspectives to be studied in the empirical part.

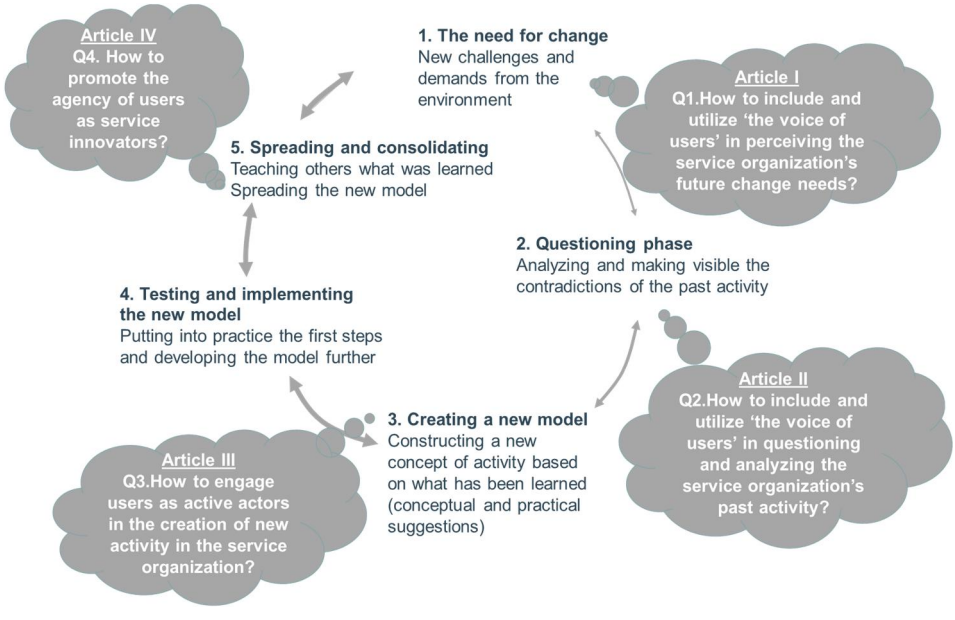

Figure 7. Research questions in relation to the main phases of the expansive learning cycle (modified from Engeström, 1987).

In Figure 7, the research questions are not phase specific but are located in-between the phases. In addition, the insight made in this study about the im-

portance of futures analysis before the analysis of past activities seemingly deviates from the progress of the original cycle (Engeström, 1987). However, because the theory of expansive learning does not emphasize an explicit futures analysis, it is possible to interpret that this analysis is a part of the cultural-historic context and the analysis of systemic contradictions (the first phase).

3.4 Research methods and data

The main methodology used in this study is *qualitative case study*. The case study approach was chosen because it is well suited to study a phenomenon that is not yet fully understood (Yin, 1994). The case study approach makes possible to address "how" and "why" type research questions (Edmondson and McManus, 2007), and hence to contribute to theory building (Eisenhardt, 1989). A variety of data sources enables gaining a rich and deep understanding of the dynamics of certain phenomena in a certain context (Yin, 1994).

As mentioned earlier, *action research* was applied in the case studies: researchers participated actively in the development workshops and meetings that were studied. This kind of grounded empiricism is justified when the focus is on work activity, i.e. when social activities in specific contexts are examined via field studies (Barley and Kunda, 2001).

3.4.1 Case contexts

All cases in this study are Finnish knowledge-intensive service organizations or knowledge-intensive departments of broader organizations. The length of the development activities in the cases varied from a half to one year. The case study discussed in Article I was carried out in a situation in which a novel research area was emerging in an applied research organization: VTT Technical Research Centre of Finland. VTT is nowadays a publicly owned company, but at the time of the case study it was a governmental organization. It has continuously strived for developing its competence to acquire funding from customer assignments and international projects. The personnel of VTT includes about 2 400 employees. During the end of 2008, when the first case study started, the 'servitizing' society had made VTT keen to expand its research competence from technology towards service research. However, knowledge on the topic was only emerging in the organization, and VTT needed to develop a new research strategy and an interdisciplinary network to learn about this substance. The first case study describes the learning attempts of managers and researchers linked to this change. Involving *the voice of users* was the particular means through which *future change needs* were mapped and *a shared vision* for service research created.

The second case study, reported in Article II, was actually conducted before the first one (see the justification above), during 2007. The case organization was MTT Agrifood Research Finland (nowadays part of Natural Resources Institute Finland), which operates in the area of bioenergy research. MTT is also an applied

research organization and had rather similar needs and challenges to VTT. It carries out agricultural, food, and environment research under the Ministry of Agriculture and Forestry and employs around 850 people in various locations in Finland. The empirical research of this thesis concerned a situation in which the organization needed to learn a novel way of producing knowledge about the emerging and societally relevant bioenergy topic. Instead of the earlier practice of producing scientific facts, there was a need to move to supporting the bioenergy firms and political decision making in a holistic way. Thus, the challenge was to create user- and service-oriented projects in the bioenergy research network. The case description includes the concrete learning activities of the management and researchers that were targeted at understanding how users can be involved *in the questioning of past activity* as a starting point for innovation endeavors. In this case, too, the involvement of users took the form of *listening the users' voice*.

The case study discussed in Article III concerned the service development of an IT company; in the development, the company collaborated with one of its customer organizations and end-users. The study was carried out in 2010–2011. The IT company is Finnish but operates globally with its 13 000 employees. The study focused on a business unit that operates in Finland and serves public organizations as primary customers; the end users are citizens. In the case study, the primary customer was a middle-sized Finnish city. At the time of the study, the IT company had understood that producing technology-based services was no longer sufficient. The business environment and business models were changing, as new digital opportunities were entering the field. In this situation, the management of the unit realized that the development of more *user- and service-oriented business was necessary and required the learning of new skills and practices.* To initiate the learning process in the organization, the management needed facilitation from the researchers. When the new approach to service development in practice was designed and tested with the customer and end-users, the progress continued independently. Thus, in the later stages of the case study, the role of the researchers was to observe the experimentation. The case describes how the IT company learned *a new service practice by engaging users as active actors in the development*.

The case study in Article IV includes actually *four sub-cases*. The studies were carried out in 2010 and 2012. The target organizations were development departments of two middle-sized Finnish cities (one of them was the same as in the case III). The size of the cities is 50 000–60 000 inhabitants. At the time of the study, the cities were among the pioneers in Finland in pursuing a user-based innovation policy. The development departments wanted to concretize this objective by designing services with users: citizens and local SME's. The development managers led the efforts, and were supported by both internal and external facilitators. In addition to the innovation-oriented policies in the cities, the background for the development was the need for more efficient and innovative ways to produce public services in the circumstances of diminishing public funding. The organizations wanted to seek an alternative to cost cutting from *innovative ways of involving citizens into the development.* Enhancing participation and empowerment was

the core of this new approach. In one city, the development projects ('sub-cases') included the creation of a new children's play area on the city market square and new solutions to the problem of youth unemployment. In the other city, the projects ('sub-cases') were two individual examples among the so-called 'mini-pilots', which this city had initiated as a new collaboration form between the professionals, entrepreneurs and citizens. Fostering the dialog between public and private actors and between different generations of citizens was present in all examined projects. All of them provide concrete examples of the ways in which *the role of users as service innovators can be promoted*.

3.4.2 Acquisition of data

The main methods for the data collection were learning interventions, observations and interviews. The learning interventions and observations took place in the development workshops and meetings. In these interventions, the researchers offered conceptual tools to the collaborative development. In the third and fourth cases, also other facilitators participated in the development work: in the third case, IT organization's consultants, and in the fourth case, public servants from the city. Researchers videotaped the workshops and wrote field observations and memos from the setup, interaction, discussions, roles, and tools utilized. Interviews were carried out as theme-based interviews of the key participants (Bryman and Bell, 2011; Hennink et al., 2011). Also some background material, such as contextual documents and reports from the previous innovation activities of the organizations, were utilized. The author of this thesis was responsible for videotaping, drafting memos, and interviewing the participants. The data gathering principles and processes are described in more detail in the following.

For *the learning interventions* (in the cases included in Articles I–III), *the method of Change Laboratory* was used. This method has been developed within the framework of expansive learning and its application 'developmental work research' (Engeström et al., 1996; 2014). The Change Laboratory method can be used to support the practitioners' collaborative reflection and to produce new principles for carrying out an activity (Virkkunen and Ahonen, 2011). In the Change Laboratory, the general models of an activity system and a cycle of expansive learning are used as tools for collaborative reflection and transformation. The laboratory offers a space, in a form of workshops, to actors to come together and reflect the tensions and change. The 'mirror data' from daily work activities is used to provoke emotional involvement. Simultaneously, the conceptual tools help the actors to distance themselves from the data and to analyze the systemic context and experiences for change (Virkkunen and Ahonen, 2011; Vygostky, 1978). This principle of interpreting data with the help of conceptual models and tools is called double stimulation by Vygostky (1978).

Also conceptual tools of *foresight, particularly roadmapping (Phaal et al., 2003), and developmental evaluation* (Patton, 1997; 2011) were utilized as intervention methods. In these interventions, the idea was similar to the Change Laboratory. The practitioners first collected the data themselves from their work activity and its

environment. Thereafter, the researchers provided them with a possibility to interpret this data with the help of conceptual models and tools (Vygostky, 1978). In this way, the researchers helped those being studied to 'reflect their activity in the mirror' (Ahonen, 2008; Engeström, 2004; Engeström et al., 2014). Based on the meetings and workshops, researchers wrote the fieldwork memos whose content was analyzed later on. These memos included notes concerning the setup, interaction, discussions, actor roles, and the tools utilized.

In the case described in Article IV, the interventions played a less important role than in the other cases. In the first two 'sub-cases' included in this case, altogether four researchers were involved in the field study: in addition to the co-authors of the article, two experts of service design participated and provided specific design tools to the development. The author of this thesis acted as an observer and interviewer in the cases together with the second co-author. The last two 'sub-cases', representing 'mini-pilots', were originally carried out by the case city and its citizens without researchers. Afterwards, the third author of Article IV carried out interviews among the stakeholders. He also made some observations on the collaboration in the cases after the active phase of the mini-pilots project was over. He wrote the field work memos and took the main responsibility for analyzing the pattern of innovation activity in those cases. The blueprints that he drew of the processes (Bitner et al., 2008) were discussed and analyzed collaboratively by the authors.

Participant observation entails a relatively long period of time of the observer in a social setting in which she seeks to observe the behavior. The observation can be concentrated on a single actor or members in a group, organization, or a community. The aim is to understand and obtain knowledge of the meaning of a behavior. The participant observer can take an active or passive role in the activities observed (Bryman and Bell, 2011). In the case-studies of this thesis, the observation took place in workshops, meetings and actual use situations of the services developed (e.g. the use of the prototype for the children's play area in case IV A). The observation concerned group dynamics and the moments that reflected situations of dialogue with the users. More specifically, the following issues were observed: how the collaboration was conducted, with whom it was performed, what was the role of the users, and what different tools were used to promote the role of the users as active actors. The role of the observers (the authors of the articles) was active in all other cases except the sub-cases in Article IV. The active role refers to discussions with the observed ones.

Theme-based interviews do not use a ready-made, structured form, but the preplanned broad themes give quite much freedom to the respondents (Arksey and Knight, 1999; Hirsjärvi and Hurme, 2001; Rubin and Rubin, 2012). The exact formulation of the questions takes place according to the situation and the interviewee. The order of the themes can change, and usually a theme involves several questions (Bryman and Bell, 2011; Eriksson and Kovalainen, 2008). The interview themes in this thesis were semi-structured and focused to the topics gauging the learning experiences from activities. More specifically, the themes were related to the following issues: how the collaboration was conducted, with whom it was per-

formed, what phases it included, what different tools were used, what was produced as outputs, what was novel or difficult, and what were the most significant learning insights. While the themes were broad, specific questions were asked according to the viewpoints and roles of the interviewees. Also illustrative material produced during the development activities, such as slideshows in the workshops, were brought to the interview situations to refresh the memories of the respondents.

'Purposive sampling' was used in the interviews, which meant that only the key participants were involved; the interviewees were selected from those persons who had most actively participated to the innovation activities. The small number of interviewees helps to increase the usefulness of the information to be acquired (Easterby-Smith et al., 2008). The key participants usually have in-depth understanding of the activities carried out (ibid.). In the case studied in Article I, no interviews were made. In Article II nine interviewees were made. They represented three perspectives: (a) the researchers (six interviewees), (b) the management of the research organization (two interviewees), and (c) the ministry as a research owner and user (one interviewee). In Article III, three key persons were interviewed (the business development manager, a senior consultant and IT consultant). In Article IV altogether 59 interviewees were made (in cases A and B 48 people and in cases C and D 11 interviewees). The interviewees were the key city representatives (development managers and organizational developers), service users, SME company representatives, and the external facilitator.

In Article II a selection method of 'snowball sampling' was utilized (Easterby-Smith et al., 2008). It means that the first respondents selected name suitable additional persons to be interviewed. The research manager of the bioenergy research was the first interviewee. He named also another manager, a civil servant as an owner and user, and three researchers to be interviewed. The manager was asked to propose such actors who were actively involved in the innovation activities. The three researchers that the manager proposes, in turn, named the following three colleagues. The sampling was stopped when it was considered that the data started to saturate.

All in all, *the main research data* in this thesis consist of the unstructured participant observations and 30 fieldwork memos of the development activities, and of the video analysis of the 9 workshops and meetings. Also some background material was used; in Article I the background material is an evaluation report compiled in VTT and used for the analysis of the first case. In the other cases the background material consisted general documents from the previous development activities of the organizations (for an overview, see Table 3 in the following subchapter 3.4.3). Theme-based interviews of the key participants concerning their experiences and learning insights in the activities supplemented the data. The interviews were conducted after the end of the development processes. The material compiled represents mostly the views of the personnel in the provider organizations, not the views of the users. This is because the primary interest was to explore how the strengthening user-agency was induced by the activities of the knowledge-intensive service organizations. The 'sub-cases' presented in Article IV

are an exception; here, also the opinions of users were collected with the theme-based interview method. In those cases, the users were actual innovators in addition to the representatives of the service organizations.

3.4.3 Analysis of data

The data were analyzed by the means of *qualitative content analysis* (Elo and Kyngäs, 2008). It is an analysis method to find meanings and intentions from the text or speech by the systematic classification of data according to the specific interest. It is usually carried out either inductively (categorization based on data) or deductively (categorization based on earlier knowledge) (ibid.). In the Articles I–IV and in the introduction of this thesis, the process of content analysis follows abductive reasoning – which includes both induction and deduction (Dubois and Gadde, 2002). The prior knowledge did have an effect on the issues that were sought in the texts and in the speech on the videos (such as certain phases of the collaboration and the ways in which the voice of the users' was present in the learning situations).

The data analysis procedure reminded the approach of 'directed content analyze' (Hsieh and Shannon, 2005). In this approach, the purpose is often to extend a conceptual framework or theory. The classification or coding of the data starts from the principles of the theory or framework in question. However, during data analysis the researchers allow new themes to emerge from the data (ibid.). In this process, the data are handled many times, and different analysis rounds are needed.

In this thesis, the theory of expansive learning was utilized as the theoretical starting point and also utilized in the content analysis of the data. In Article I, the content analysis was made based on video recorded workshops. In Articles II-III, the interview themes and analysis categories followed the main phases of the expansive learning cycle. In the Article IV, the interview themes and the analysis categories followed the observed phases of the planning and practice-based innovation.

More specifically, in the case of Article I (content analysis of the video-recorded workshops), the analysis focused on the moments that reflected the dialogue between the management and researchers (the employees) in a workshop in which the future change needs and a shared vision were elaborated. First, the videotapes from all five workshops were replayed by the author to get a general picture of the dialogue formation. Second, the author focused on a specific situation of dialogue in the foresight workshop that aimed to create a shared understanding of the future change needs and vision. The tape was replayed multiple times to transcribe the dialogue. The author wrote down, word by word, the speech of the participants and marked down also the moments of emotional expressions. Third, she made a preliminary analysis table that contained notions of the manager's vision and views and concerns of the employees. From this table, the structure of the dialogue started to be formed. Finally, she edited and refined the table and compared it to the theory. The final table is attached in the Article I.

For the content analysis of the interviews (Articles II–IV), the interview records were first transcribed by an external professional company. The transcripts contained the interviewee's speech as well as breaks and relevant emotional expressions. The author of this thesis made sure the accuracy of the transcripts by checking that they corresponded to the interview tapes and the notes made in the interview sessions. The transcripts in the case for Article IV were checked collaboratively by the authors.

The qualitative content analysis of the interview transcripts (Articles II–IV) was carried out via abductive reasoning (a dialog between theory and practice, Dubois and Gadde, 2002). Based on the theories of expansive learning as well as user-based innovation, the analysis focused on the phases of collaboration and on the way in which the voice of users was utilized in different phases and interaction moments. First, the author(s) read the interview transcripts to gain the general picture. Second, the author(s) made another round during which they made notes from the central issues emerging from the transcripts. In that round the author(s) marked down their notions into a 'draft table'. The categories of the table were formed with the help of the expansive learning and user-based innovation theories. However, when novel issues emerged from the data, new categories were created. Finally, the author(s) edited and refined the tables, and the analysis was compiled into summarizing tables, that showed the structure of the collaboration: its phases, the tools, and main results from each phase. Based on the categories we compared our findings to the theoretical framework and formulated the answers to the research questions. The other material, such as the fieldwork memo's and their content, were also analyzed by classification into themes similar to the interview transcripts.

In all, the author of this thesis took the main responsibility for the qualitative content analysis of the data (Elo and Kyngäs, 2007). Except from this is the analysis in Article IV, which was carried out by the co-authors of the article. In the writing of the introduction of this thesis, the data were re-analyzed at a 'meta-level' by the author. Here, the focus has been on the moments reflecting the strengthening user-agency and the ways in which the collaboration with the users was realized.

3.4.4 Summary of the methodological choices

Table 3 shows the data collection methods, nature of data, and the units of analysis according to the articles and the respective research questions. Each case offered the researcher a complementary window to understand the research phenomenon from action oriented perspective and increased knowledge in a cumulative way.

Table 3. The research questions, data collection methods, data, and units of analysis.

Article	Research question	Data collection methods	Data	Units of analysis
I	1. How to include and utilize 'the voice of users' in perceiving the service organization's future change needs?	Learning interventions, video-recording and participant observations	Analysis documents from 5 video-recorded workshops, field-work memos from the observations of these workshops, background material (evaluation report)	The moments that reflect the situation of dialogue and of the involvement of user-perspective
II	2. How to include and utilize 'the voice of users' in questioning and analyzing the service organization's past activity?	Learning interventions, video-recording, participant observations and theme interviewing	Analysis documents from 4 video-recorded workshops, field-work memos from the observations of these workshops, and 9 interviews	The moments that reflect the situation of dialogue and of the involvement of user-perspective Participants' insights: what was learned from the users
III	3. How to engage users as active actors in the creation of new activity in the service organization?	Learning interventions, participant observations and theme interviewing	Field work memos from the observations of 10 workshops, 3 interviews	The moments that reflect the situation of dialogue and of the involvement of user-agency Participants' insights: how the processes took place and what was learned from the users
IV	4. How to promote the agency of users as service innovators?	Participant observations and theme interviewing	Fieldwork memos from the observations 10 workshops and use situations, 59 interviews (48 in 'sub-cases' A and B, and 11 in 'sub-cases' C and D)	The moments that describe how the user collaboration took place or was implemented by the users themselves Participants' insights: how the processes took place and what was learned from the users.

The main data collection methods in this thesis were learning interventions, video-recording, and participant observations. Theme interviewing of the participants supplement the methods. The main data consists of the analysis documents created in the video-recorded workshops and of the fieldwork memos; the transcribed theme interviews are used as supplements. The number of interviews was largest in the case described in Article IV, as that case included the interviews from four sub-cases. The units of analysis in the Articles I–III consist of the moments that reflect the situation of dialogue and the involvement of user-perspective and agency in the activities. For example, it was analyzed how the employees and managers discussed with the users, and what the users proposed to be done. In Article I, we focused on the moments that describe dialogue in the vision creation. In Articles II–IV, the units of analysis include the participants' insights into how the collaborative processes took place and what was learned from the users.

For the purpose of summarizing the methodological choices, reasoning process and the main background assumptions, this thesis utilizes the framework created by Lampela (2009). This framework summarizes well the methodological choices made in the study. However, it has to be slightly modified to illustrate better the ontological and epistemology aspects of this study. The original framework – the triangle – has been turned upside down to describe the fundamental nature of philosophical issues. Figure 8 presents the modified frameworks applied in this thesis.

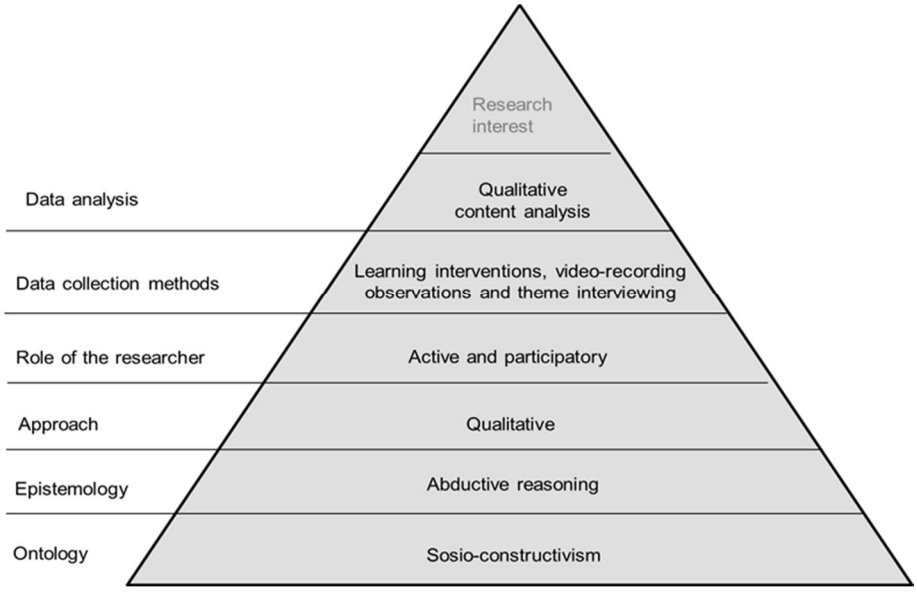

Figure 8. Summary of the background assumptions and methodological choices of the thesis (modified based on Lampela, 2009).

Figure 8 depicts that the background assumptions of reality (ontology) follow socio-constructivism in this study. The knowledge creation (epistemology) follows the principles of abductive reasoning. The research approach is qualitative case study, and the role of the researchers has been active, participatory and reflective. The empirical material is based on interventions and observations concerning the innovation and learning activities, and theme-based interviews of the key persons involved supplement the data. The data were analyzed by the means of qualitative content analysis.

4. Summary of the results

Next, I summarize the findings of Articles I–IV in relation to the specific research questions. Table 4 presents the main findings of the studies reported in four articles. For each study, the learning perspective with users, learners, role of users, approach to the users, role of facilitators and learning outcomes and (possible) changes are described. The purpose is to describe how innovation activities in knowledge-intensive service organizations can be understood as a collaborative learning activity that involves a strengthening user-agency.

Table 4. Summarizing the results of the Articles I–IV.

Article and the learning perspective	The learners	Role of users	Approach to users	Role of facilitators	Learning outcome from the organizational view point
I) Perceiving the future change needs (Article I)	Employees and managers as active actors whose future views were inspired by knowledgeable lead-users.	Lead-users as evaluators and inspirers pushing the need for change from the strategic perspective. Lead-users inspired visionary actions among managers and employees.	Users' viewpoints were the starting point and source of innovation. They were mediated by the employees and managers in the learning situation. With a roadmapping exercise, a shared vision was crystallized. An example of user-driven innovation approach.	In the planning-based process, users designed and implemented the new solution with employees. An example of user-based innovation approach. In a practice-based process, users were empowered to implement the innovation themselves. An example of user-led innovation approach.	Understanding of the changing environment and various viewpoints as a starting point for the shared vision and expansion in the object of activity (user and service-oriented projects). A novel way to utilize user-understanding in mapping the future change needs, organizing interdisciplinary research and encouraging the top-down and bottom-up perspectives to meet.
II) Questioning and analyzing the past activity (Article II)	Employees and managers as active actors whose past activity was questioned by knowledgeable lead-users.	Lead-users as active actors in collaborative evaluation. A viewpoint of one user was mediated by a video, as he was unable to participate. Lead-users' voice was like a questioning mirror and stimulus for the creation of new activity.	Users' were evaluators. Their viewpoints were the starting point and source of innovation but they were not approached as collaborative developers of the new activity. An example of user-driven innovation approach.	Facilitators planned the collective learning arenas, methods and tools that enhanced dialogue with the users and helped to perceive the object of activity from their perspective. Management supported the facilitators by committing to the work. Facilitators contacted and prepared the users to their evaluator roles.	Shared understanding of the users' needs and impact was created. A way to question the old activity together with users as the starting point for the creation of new activity (new projects as innovation endeavors). User-oriented way for managing interdisciplinary research and bridging the top-down and bottom-up perspectives.

III) Creating new activity (Article III)	Employees and users as active actors in a practical experiment; employees were learning the context and renewing needs of users. Managers as participators in the learning situations to reflect conceptual and practical issues.	Lead and ordinary users as collaborative developers in the experiment together with the employees.	Users were active actors in planning and realizing the novel solution together with the employees. An example of user-based innovation approach.	In collaboration with the management, facilitators planned the learning arenas for enhancing the collaboration. In the collaborative experiment consultants from the IT organization (service provider) acted as facilitators and offered conceptual knowledge, models, and tools that provided structure and helped to reflect the experiences.	Change in the provider's orientation: users are acknowledged as active actors in the creation of new activity that required collaborative experimenting and conceptual learning. Learning how to bridge the practical experiences and their broader reflection. Organizational learning process for service innovation was created. It enabled top-down and bottom-up processes to meet.
IV) Testing and implementing the new activity (Article IV)	In the planning-based process, employees and managers learned with the users in long-term relationships. In the practice-based process employees and managers learned from the users.	In the planning-based process, ordinary users were collaborators who ideated and tested alternative solutions within a given framework. In the practice-based process ordinary users were empowered to experiment, decide the content, and schedule the development.	In the planning-based process, users designed and implemented the new solution with employees. An example of user-based innovation approach. In a practice-based process, users were empowered to implement the innovation themselves. An example of user-led innovation approach.	In the planning-based process, the back-office group collaboratively designed the structure, arenas, tools, and methods for the development. Users were encouraged to participate with active facilitation. In the practice-based process, a novel internal role was created to encourage users' agency. A 'citizen agent' mediated knowledge between the experiments and the managers.	The planning-based process required resources and time from the provider but gave insights into new, equal structures for innovation and testing. In the practice-based process, allocation of the resources between the provider and users were renewed radically. A challenge for the provider arose: how to learn from the users in order to link the insights into the strategic decision making.

4.1 The 'voice of users' in perceiving the service organization's future change needs

The empirical research in Article I was conducted when a novel research area was emerging in VTT Technical Research Centre of Finland. VTT has a history of being one of Europe's leading technically-oriented research organizations by focusing on the development and application of high-end technology. At the end of year 2008 both Finnish society and VTT faced the need to expand the research capability to service research. To address this need, VTT made its first significant investment in service research by establishing a three-year research program called the Service Beyond. VTT had problems of not being successful enough in service research calls due to the excessive focus on technology (Leiponen et al., 2008). There were single service research projects spread throughout the organization and no one seemed to have an exact understanding of the research capability.

The learning challenge of the organization, i.e. entering to a new research area, corresponds to a situation where the organization needs to become aware of its environmental and market drivers, change needs, as well as resources and solutions needed for its strategy and vision (e.g. Child, 1997; Kim and Mauborgne, 1999). In expansive learning terms, the learning challenge corresponds to *perceiving the future change needs* as a motive and trigger for learning (Engeström, 1987).

Based on Article I, I concentrate on discussing the events that led to the establishment of VTT's service research learning network as a strategic activity and describe the user role. The authors of the article acted as facilitators for the learning process and offered conceptual as well as practical knowledge and tools to the process. The workshops were planned as arenas and events of 'expansive shifts' with the support of the management. Future-oriented methods and tools were used to connect learning into the strategic aims of the organization. Lead-users (von Hippel, 1986) of service research were invited to join the process. In this case, lead-users referred not only to users of a service in a traditional sense (e.g. mobile phone users), but to leading international and national experts, such as research professors or company managers, who were a step ahead of VTT in service research activities.

Knowledgeable lead-users to push the need for strategic change

To boost the search for VTT's future direction in service research, managers from the top level asked three international experts (lead users by von Hippel, 1986) to conduct an evaluation of the first efforts VTT had taken in the service research. In their evaluation report and discussions with the management, lead-users reported advances in the topic as it was new at the time both to the Finnish organization and internationally. However, they saw also many bottlenecks to be solved in the

future and suggested actions for improvement. For example VTT was recommended to involve users at earlier stages in the innovation projects and focus less on technology and more on user-perspective and 'bottom-up' synergies among experts. Also a crystallization of the strategic goals and objectives were suggested. Lead-users proposed the strategic goals and objectives to be built on an interdisciplinary research capability and explicit view of the changing market and VTT's role in it (Leiponen et al., 2008).

The knowledgeable lead-users acted as outside evaluators pushing the need for strategic change, and to specify an important market trend. In other words, the upper management was advised *by* and learning *from* the knowledgeable lead-users. However, since the evaluation was directed to the upper management, it was realized that the creation of a novel research strategy and vision needed to be discussed also with the researchers of the organization. These ideas inspired the creation of VTT's service science and business (SSB) network that started to foster the research capability and transcend organizational 'silos'. Approximately 30 people, researchers and middle-managers, from multiple organizational units were asked to participate and create a shared understanding of VTT's service research capability and strategy.

Lead-user as an inspirer for visionary actions among managers and employees in a collective learning situation

In the first workshop of the SSB network, the participants (service researchers and managers) understood that a single meeting was not enough, but there needed to be a more long-term learning process. Consequently, the purpose of the second workshop was to continue and go deeper into the dialogue and future visions of the upper management and researchers. To inspire the discussion, facilitators invited to the workshop a national 'lead-user' (von Hippel, 1986) to open up perspectives for future research. The visitor was a service research professor and the head of the 'service factory' at the recently established Aalto University. In his speech he unveiled some important points of departures for VTT's service research and highlighted its importance as an emerging societal, research, and business field. He discussed some of the future trends, research capabilities needed, and customer insights. He also encouraged collaboration between the research institutes in Finland. The lead-user left the workshop after a collaborative discussion in order for the internal strategy work to continue.

The visit of the lead-user to the learning situation proved to be an important signal which strengthened the view of the managers and researchers that the area was something worth pursuing. For example, it was realized that the lead-users and collaborators were already working with the topic, so VTT had to soon make visionary actions if it was about to be among the first to answer to the changing needs. This way, the lead-user acted as *an inspirer* in the strategic learning situation from whom the managers and employees got insights to take further innovative actions.

Users' voice mediated differently by the employees and managers in a boundary crossing situation

Later in the second workshop, to concretize the future-oriented discussion towards a shared vision and first strategic actions to be taken, the top manager of the area was asked to explain his vision of VTT's service research. In his speech he was reflecting the user-perspective on a *rather conceptual and strategic level*. For example, he referred to the national and international environment by stating that he was convinced that 'no one' knew exactly where we were heading with the topic, but all could see that the direction was there. By 'no one' he referred to the funding organizations, competitors and collaborators, such as universities and ordinary users. The manager then encouraged researchers to open a discussion about his vision. Interestingly, only one question was asked. It concerned the formality of the vision: 'How official is it and how can we influence it?'

To encourage participants to discuss about the vision, the facilitators of the workshop divided the participants to smaller groups. To make the views and concerns visible, the participants were asked to write down them as a simple, future-oriented 'fishbone'. In the discussion of the researchers the user viewpoint was also mediated but the perspective differed from the manager's perspective. It included strategic issues such as potential international and national research partners, but reflected also more operational issues, such as concrete collaboration practices.

After the exercise, facilitators gave another opportunity for the researchers to comment the manager's vision. An intense conversation started regarding where VTT should focus its service research. Overall, it was considered important for the SSB network to continue to deal with the questions raised later during the workshop with roadmapping exercise. The exercise crystallized the environmental change drivers, the first ideas for the future concepts, and a shared vision.

The findings in Article I indicate that the lead-users acted as important sources of knowledge in a strategic learning situation where the organization was searching for its future direction. The situation was not a use-situation or a development situation of a single product or a service reported in previous studies (cf. von Hippel and Tyre, 1996; Oliveira and von Hippel, 2011). Thus, the lead-users acted as *evaluators and inspirers initiating the organization's change needs from a strategic perspective*. User perspective was also mediated by the service researchers and the manager in the learning situation. Under the circumstances, when utilizing service innovation terms, user's role was approached in terms of user-driven innovation (Zeithaml et al., 1990; Sundbo and Toivonen, 2011).

Based on the results, the learning intervention and facilitation of the dialogue with the help of future-oriented methods and tools promoted learning among the management and employees and assisted in the creation of the shared vision. The future perspective was fostered in the process with a roadmapping exercise which strengthened the mutual learning and vision. Article I contributes to organizational learning and service innovation literature by showing how to combine frameworks and tools from foresight (Ahlqvist et al., 2012a; Phaal et al., 2003) and

expansive learning (Engeström, 1987; 2004) to push the participants to move forward in their 'zone of proximal development' in order for innovations to occur.

To summarize, the Article I and its 'Learning by Foresighting' process (LIFE) make a contribution to the organizational learning literature by combining the theory of expansive learning (Engeström, 1987) to the frameworks and tools of foresight (Phaal et al., 2003). Foresight tools, combined with the lead-user interaction, provide a way to connect learning to the strategic aims of organization. Also the contribution to the learning research includes empirical analyzes on how to strengthen the role of lead-users in the learning process. Those concrete actions and learning tools were analyzed which describe how learning from the lead-users took place in order to conceptualize the future change needs.

The contribution to the service innovation studies in Article I includes empirical and theoretical analyzes how to make the top-down and bottom-up innovation perspectives to meet (Saari et al., 2015; Sørensen et al., 2013). The contribution is made through the creation and analysis of collective learning process inspired by expansive learning (Engeström, 1987) and foresight (Phaal et al., 2003). The process describes how learning can be the driving force behind innovations, instead of an underlying phenomenon. In addition the process offers a concrete way for managing future-oriented and collaborative learning with lead-users in order for innovation to emerge.

After the learning process described in this study, collaborative learning in the service research network at VTT continued, and continues still. At the time of publishing Article I, the authors discussed with the management of VTT whether they saw any tangible results and changes in the research activity. The managers involved had been following the composition of new service research projects and VTT's success in service research calls. The managers had noticed that VTT had been more successful in the efforts than ever before; the projects were multidisciplinary and above all, more user and service-oriented. The managers felt that this was largely due to the learning that had taken place in the SSB network (VTT's Annual Report, 2009).

4.2 The 'voice of users' in questioning and analyzing the service organization's past activity

The empirical research in Article II was conducted at MTT Agrifood Research Finland between summer and autumn 2007. During that time, due to the declining rural population and the proportionally decreasing importance of agriculture to the Finnish economy, MTT looked for new research opportunities in the emerging field of bioenergy. The management of the area saw that there was a need to learn how to create a novel way of producing applicable research knowledge in the societally relevant bioenergy field. Instead of producing fragmented scientific facts, researchers would need to learn to create bigger and more multidisciplinary research projects with higher impact on the users and on the society.

An organizational learning process was implemented for the bioenergy researchers of MTT with the support of the management. It was named 'Developmental Impact Evaluation'. The process was based on the combination and contribution of expansive learning (Engeström, 1987) and developmental evaluations (Patton, 2011; also Lähteenmäki et al., 2006). The authors of the article acted as the facilitators. They created the learning structure, conceptual and practical tools in order for the researchers from different projects and organizational units to come together to learn about the impact of their past projects together with the lead-users (von Hippel, 1986). The lead-users in this case represented national forerunners in the field of bioenergy from a scientific, business, and societal perspectives. The first phases of the process focused on *analyzing and questioning the past activity* (Engeström, 1987) as a starting point for a new, expanded research concept. It aimed at perceiving the research as a part of the users' activity and including societally topical questions.

Evaluating the past activity with knowledgeable lead-users at the project level from a strategic perspective

The central idea of questioning the previous activity to enable expansion was as follows. Learning had to take place on the practical activity level of the researchers and to be connected to the strategic aims (Engeström, 1987; Patton, 1994; 2011). This meant that concreteness and tangibility were needed for analyzing and questioning the previous activity.

In the first phases of the process, after discussing the future bioenergy prospects, collective *evaluation of two past research projects* was conducted. The projects were intentionally chosen among the pioneering projects and to be different from each other. One of the projects produced new knowledge about the future prospects and environmental influence of bioenergy, especially to policy makers. The other project concerned the utilization of by-products from the biogas process.

A project was selected as the unit of analysis because, rather than a team or a group, a research project forms the unit of most research work. A problem is formulated in a project and it works as the locus and embodiment of innovation embryos in the context of applied research (Van de Ven, 2000). The projects were intended to offer to the bioenergy researchers' tangible objects for questioning the activity and perceiving it from the users' perspective.

For evaluation of the projects, the concept of 'impact of activity' (Lähteenmäki et al., 2006) was noticed to hold potential in creating criteria for reflecting whether the past research activity had met the topical scientific, user, and societal needs (Lähteenmäki et al., 2006; Nowotny et al., 2001). See Figure 9.

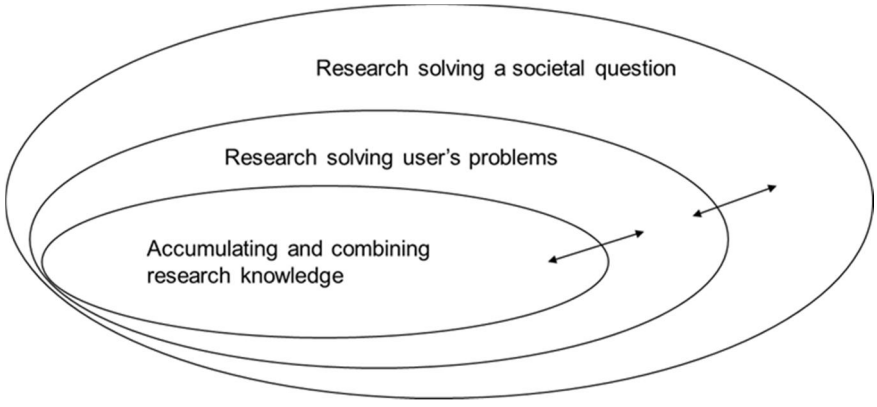

Figure 9. Impact of applied research from three interlinked perspectives (Saari and Kallio, 2011).

Figure 9 demonstrates how applied research has to balance simultaneously the interests of science, business, and society (Lähteenmäki et al., 2006; Nowotny et al., 2001; Van de Ven, 2000). For example, bioenergy is a part of the agricultural processes and dependent on political decision making. To the evaluation situation, *concrete user viewpoints from each perspective (science, business and society) were needed.* The facilitators identified together with the program manager altogether six lead-users (von Hippel, 1986) (two lead-users from each perspective and from two projects). The lead-users included two national research professors, two representatives of bioenergy firms, and a ministry civil servant. One user who couldn't participate sent his comments via video. The video was recorded when the facilitators had prepared the users for their evaluator roles. Facilitators visited each user on their premises beforehand, informed them about the projects to be evaluated, and also encouraged them to give a constructive criticism of the completed projects, if needed.

Lead-users as questioners and stimulus for the creation of new

In the learning situation, the lead-users evaluated the research projects by explaining what seemed beneficial and what seemed to be future research needs. For example, the chair of the board of a biogas firm expressed that instead of gaining more information about the individual characteristics of the by-products, he needed more comprehensive information to support the business development and bioenergy as a profitability business in Finland. This way, the *consequences and the 'impact' of the past research were made visible from the user-perspective* as the lead-users explicated to the bioenergy researchers how they had benefited from the study and what they would need more from future research.

The bioenergy researchers' task was to 'study', observe and analyze the needs of the lead-users first individually and then in small groups. For this purpose the

facilitators offered a conceptual learning tool based on a model of applied research (Van de Ven, 2000, p. 14). The idea in the tool is that, to achieve high-quality applied research and create impact, the research should tackle the following four viewpoints:

- solve the user's problem
- accumulate knowledge and understanding of the research community
- address a current societal issue, and
- create some novel methods that could be transferred to other projects.

The notions of the bioenergy researchers aroused plenty discussions in the small groups. Critical perspectives identified ruptures and problems in the communication, but also new project ideas emerged that would answer better to the expectations of the lead-users were discussed.

The main goal of the evaluation of the two projects was to enable the questioning of the old way of conducting research with the help of the 'lead-users' voice'. In the evaluation situation the practitioners themselves collected data of their own work and interpreted it with the help of a conceptual tool – dual stimulation by Vygotsky (1978; Engeström, 1987). In this case, the 'users' voices' represented the 'raw data' that the bioenergy researchers interpreted.

Based on the interviews, it was obvious that the analysis of the 'voice of the users' had brought the bioenergy researchers better to appreciate *the strengths, deficiencies, and future challenges of the bioenergy research* (Engeström, 1987). The lead-users' comments felt motivating but also challenging when heard straight from 'the user's mouth'. Feedback about the projects aroused even defenses in some researchers of the evaluated projects. Facilitators and conceptual tools played a key role in modifying the defenses into learning actions for the future. Altogether, it became clear that researchers were able to perceive the object of their research from the users' perspective. This way, a rather major 'qualitative jump' seemed to evolve.

The contribution of the Article II can be summarized as follows. A contribution to the organizational learning studies is the integration of the theory of expansive learning (Engeström, 1987) to the developmental evaluation (Patton, 2011). It appeared that utilizing projects and multiple lead user-perspectives as mirrors seems to be a good way to stop, create space and time, and critically evaluate one's work. The lead-users (von Hippel, 1986) were approached as active 'questioners' from whom the organizational members learned about the shortcomings of their past activity. The evaluation implemented with the lead-users enabled the organizational members to understand the shortcomings of their work on a more conceptual level and expand the object of activity to include the aims and needs of the users.

In the learning terms, the lead-users acted as 'questioners' and 'stimulus' for the creation of new ideas for the bioenergy researchers. In service innovation terms, the ideas of the lead-users were taken as *a starting point* which means that they were approached with user-driven innovation approach (Zeithaml et al., 1990;

cf. Sundbo and Toivonen, 2011). The users performed as 'informants' rather than active actors in the creation of the new activity in the service organization.

The learning process analyzed in Article II generated learning on two levels. First, the process helped the participants to produce new multidisciplinary research proposals as innovation embryos. Second, the process offered the management a user-oriented and networked way of managing research and plan future activities. This way, the Article II contributes to the service innovation studies by describing how to make the top-down and bottom-up innovation perspectives to meet (Saari et al., 2015; Sørensen et al., 2013). It does this though a learning process that covers both learning from the past (exploitation) and actions for the future (exploration; March, 1991).

4.3 Engaging users as active actors in the creation of a new activity in the service organization

The case study in Article III studied collaborative learning activities in an IT organization together with its customer organization and end-users, between 2010 and 2011. At that time, the business environment and models were changing due to the digitalization in the society. Novel digital service opportunities, such as social media, were entering the field. The case organization had offered rather provider-centric and technical solutions to the customers. The upper management of the organization perceived that more user-oriented business development and value co-creation with the users (Vargo and Lusch, 2004; 2008) needed to be learned. In learning terms, this challenge refers to the creation of *a new concept of activity* (Engeström, 1987) with users as active actors in the learning process.

The case study focused on a business unit that serves the state administration and public organizations as primary customers; the end users are citizens. The perspective in the study was the IT organizations (named as the service provider). We were interested in how the user-oriented business development was learned in the organization and how the engagement of the users took place in the creation of a new activity. The authors' role was to help the manager involved in the study to construct and facilitate the internal learning process at the service provider organization. The authors became observers of the experiment after the manager had chosen the customer with whom to deepen the collaboration.

Multiple learning cycles were observed that interact with the service provider's strategy and practice with the users

Based on the case study, a preliminary 'model' was constructed to describe how the learning process emerged inside the service provider organization and how the users were engaged as active actors. First, the learning cycle of the service provider organization was identified. This followed the principles of the expansive learning (Engeström, 1987; 2007). Second, a collaborative learning experiment

with the customer and end-users took place. Similarities with Dewey's (1910) principles about experimenting in practice when attempting to change a pattern of behavior were identified. The 'model' of how the new activity was carried out is demonstrated in Figure 10.

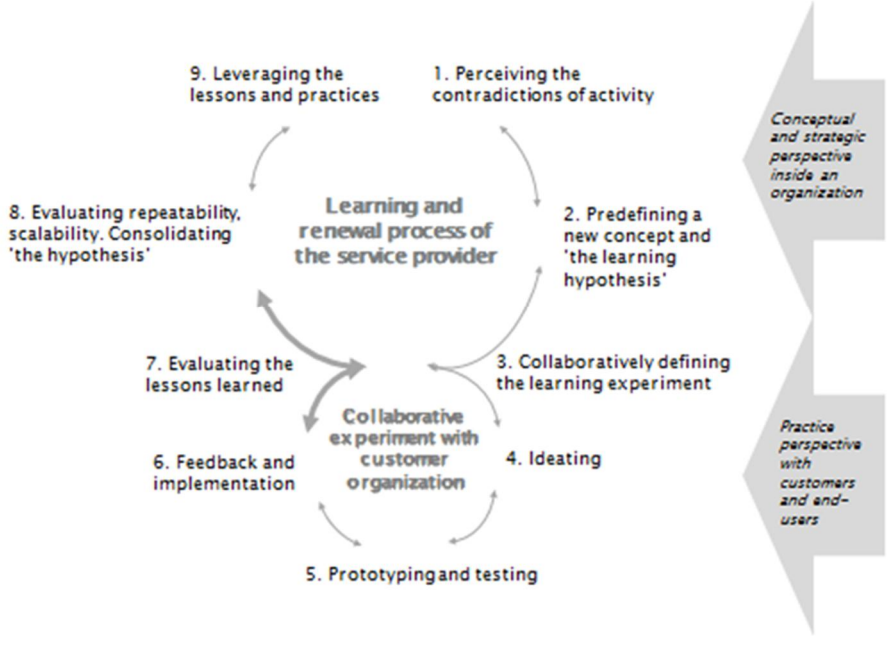

Figure 10. Multiple learning cycles[4] interacting with the service provider's strategy and practice with users (Kallio and Lappalainen, 2014).

Like demonstrated (Figure 10), the internal learning process of the service provider organization started at the phase 1, from identifying future possibilities in the environment and explicating the contradictions in the activity from strategic perspective. The conditions of how and why the business environment was changing were explored by the means of roadmapping (Phaal et al., 2003). The questioning of the previous activity was realized by the means of developmental impact evaluation (Saari and Kallio, 2011). Then in the phase 2, a 'learning hypothesis' was created; its aim was to define, loosely, the new service concept(s) to be developed. The activities were carried out in an internal network of ten people from different functions of the service provider. The network members were representatives from strategic management, sales, new concept development, and consultancy.

[4]In the Article III and in the upper cycle the term renewal refers to innovation.

The importance of experimenting and experiencing in practice with lead and ordinary users

In the discussions between the manager in charge of the learning and business development process and the authors of the study, it was realized that the IT organization would benefit from choosing a customer with whom to pursue and experiment the novel business opportunities in practice (3rd phase in the model, Figure 10) (cf. Dewey, 1910; Miettinen, 2000). The manager made the final decision of the partner. The city organization which was chosen as the pilot partner was one of the first to take advantage of user-based development in the Finnish public sector (lead-user by von Hippel, 1986). The business development manager, a senior consultant, and an IT consultant formed the core group of the service provider for the experiment. The other actors in the collaboration were:

- five customer representatives: a development manager, community planning manager, two urban area designers and an architect;
- hundreds of end-users: adults and children; and
- four researchers; two focused on service design and the two authors studied the process from a learning perspective.

The experiment started with a kick-off meeting at the customer's premises. It aimed at finding a shared view for the collaboration. The service provider's core group described how they were keen on exploring the opportunities that social media would provide. The customer described how it was interested in involving end-users to the public service development in practice. The core group chose a shared development object. The object was to design together with the end-users a play area for the city's market square. Both parties saw the experiment as a process in which novel development approach, roles and tools could be tested.

The experiment lasted over a period of six months' time. During that time collaborative ideating, prototyping, implementation, and evaluation were carried out. To guide and make the process transparent to the end-users, the service provider provided a social media platform to the experiment. The ideation of the concrete development target (4th phase in Figure 10), a play area in the city market square, was undertaken both at workshops and with the social media platform. The discussion was facilitated by a local moderator from the customer organization by releasing questions on a daily-basis. The different ideas created were concretized based on service design methods and through a prototyping exhibition at the city library (5th phase in Figure 10) (Saco and Goncalves, 2008). The prototypes were tested and evaluated by ordinary end-users, including children with the support of their parents.

The experiential exhibit offered many reflection opportunities (6th phase in Figure 10) for different interest groups. These were for example drawing for the children, and for the parents posting on the web, and giving feedback to the core group of the experiment. In all, the exhibit attracted hundreds of end-users to test the prototypes and approx. 2000 visits to the platform. The popularity surprised the

service-provider and the customer. The final design for the play area was drawn by an architect with the help of a sparring end-user workshop. The final stage for the end-users to participate in the experiment was a feedback request created on the social media platform. Altogether, the service provider played an active and facilitating role in the experiment; it offered structure and novel tools to the collaboration (such as the social media platform).

The last phase of the experiment (7th phase in Figure 10) was a reflection workshop among the service provider, customer, and researchers. The experiences gained during the experiment were evaluated in relation to the 'learning hypothesis'. The aim had been to experiment user- and service-oriented development and better value co-creation (Dewey, 1910). In addition, the researchers explicated an analysis of the end-users' feedback at the social media platform and the interviews made. The workshop ended with a discussion of how the experiences gained could be applied elsewhere. The customer was keen on continuing the user-oriented development approach.

The importance of reflecting and bridging the practical experiences to the conceptual and strategic processes of the service provider

After the experiment ended (8th phase in Figure 10), the experiences gained in the user-experiment were bridged back to the service provider by the persons involved in the experiment. The experiences were collaboratively reflected in two workshops. Representatives from strategic management, new concept development, and consultancy attended the workshops. Both practical and conceptual perspectives were discussed. It was observed that the reflection workshops seemed important for the persons who took part in the collaborative experiment. Through the experiment and time for the collaborative reflection (Dewey, 1910; Engeström, 1987; 2004; 2007), the actors mindset broadened to perceive what it meant to create business in conjunction with user and service-orientation (Vargo and Lusch, 2004; 2008). For example, it was learned that the social media platforms themselves do not create the value, but it is co-created by supporting the customers' and users' topical needs and aims. In this case, it was to support the customer in his efforts to involve end-users in the public service development.

Second, the conceptual learnings were discussed with the service provider's managers to create a link between the conceptual learnings and the strategic aims. These aims included issues of the changing business-logic and role of the service provider. This seemed important and can be seen as steps towards the 'hypothesis' or conceptual level of learning. This means, that the persons understood what the lessons learned meant for the creation of new service business. Finally, it was the service provider's decision how to continue the learning cycle and develop the business in conjunction with user and service-orientation (the last 9th phase in Figure 10).

Altogether, in Article III a contribution is made to the organizational learning literature and service innovation literature by describing and analyzing the concrete activities that explain how the engagement of customer and end-users was real-

ized and learned. For the service innovation literature, especially to the value-based theories (Vargo and Lusch, 2008; 2013), the analysis describes how the change in the business orientation and in concrete practices towards a 'service-orientation', were collective learning challenges for the service provider. The empirical analysis showed *the importance of practical experimenting and collaborative learning with the users*. The service provider, customer and researchers 'dived persistently' into the users' life in order to learn their novel needs, aims, and service provider's renewing role in supporting them (cf. Hirvonen and Helander, 2001). Via the collaborative experiment, it was learned how users play an active role in the value co-creation and initiating innovation (Vargo and Lusch, 2004; 2008; Vargo, 2013). For these purposes, resources, novel practices and 'meta-skills' of social sensibility were needed as the service provider was responsible for facilitating the collaborative development among the parties (Ballantyne and Varey, 2008; Cassidy et al., 2013; Sørensen et al., 2013).

A more detailed contribution to service innovation theories is the finding about the importance of *mediating and bridging* the practical learning experiences to the conceptual and strategic learning of the organization (cf. Crossan et al., 1999; Engeström et al., 2014). The results suggest that a change in the service provider's orientation to involve users as active actors in the creation of new activity required that the practical experiences and their broader, more conceptual reflection *went hand in hand*. Hence, when service-orientation is pursued and users are to be engaged as active actors in service innovation, multiple learning cycles in the practical (Dewey, 1910) and conceptual level are needed (Engeström, 1987). The combination of expansive learning (Engeström, 1987) and reflective though and action by Dewey (1910) made it possible to describe the multiple learning cycles. Hence, the Article III expands the knowledge about the social process through which value co-creation, service innovation, and learning processes take place. The contribution is made by tightening the link between the service-dominant logic (Ballantyne and Varey, 2006; 2008; Vargo and Lusch, 2004; 2008), expansive (Engeström, 1987; 2004) and reflective learning theories (Dewey, 1910; Miettinen, 2000).

The researchers' role in clarifying the learning efforts proved important in the case study. After the Article III was published, the service provider's representatives explicated to the researchers that they had been able to generate new business based on the learning that had taken place in the collaboration.

4.4 Promoting the agency of users as service innovators

In Article IV innovative ways to develop public services and promote the agency of users as service innovators were studied in two public service organizations located in two mid-sized Finnish cities. The case study was conducted during years 2010 and 2012. The learning challenge defined by the organizations dealt with the fact that novel and more efficient ways to produce public services were needed due to the shrinking Finnish economy and changes in the society. Topical chal-

lenges were issues such as youth unemployment, social and regional inequality, and crumbling community spirit. The development managers of the organizations started to seek novel ways to solve the questions by involving citizens and local companies (defined as users) in the innovation activities. In expansive learning terms, the challenge faced by the service organizations referred to a situation of *testing and implementing a new model of activity* (Engeström, 1987) with the users as innovators.

Four sub-cases of the two organizations were studied as illustrative extracts of different types of innovation approaches and processes through with the agency of users were promoted. The innovation approaches were modelled by the researchers of the Article IV. They were noticed to resemble more specifically two alternatives; the planning-based and practice-based innovation processes**.**

The cases A and B were rather similar to the planning-based (stage-gate) innovation process (Alam and Perry, 2002). The actors modified the innovation process to take into account the iterative and collaborative nature of learning (Gottfridsson, 2010; 2012). Case A focused on collaboratively designing a play area for a city market square and case B was about creating a new model for employing youth with local SMEs and the unemployed youth. The aims in the cases A and B were to achieve practical end-results (such as 'a plan for the meeting place' and new 'collaborative modes' between the youth and SME's). Also, the cases aimed at creating a model for collaborative innovation that could be used in other development targets in the city.

The core group in the cases A and B involved the development manager, few employees, two service design researchers from University of Lapland, and a technology-oriented KIBS (knowledge intensive business service). These actors formed the back office group which collaboratively designed the structure, arenas, and tools to be utilized. The public organization provided the physical and virtual spaces. The KIBS took the main responsibility for clarifying the roles among the parties and activating the users.

The cases C and D (called mini-pilots in the second city) were noticed to resemble more closely the practice-based innovation process, which we called rapid experimenting (Engvall, 2001; Toivonen, 2010). More specifically, case C was a 'life cycle café' run voluntarily by elderly once a week to school children, who in their turn taught e.g. IT skills to the elderly. Case D was a 'sports club' targeted to activate young men who were in danger of, or who already were displaced from society. The key elements of 'the mini-pilots' were low bureaucracy in the application and reporting process. The public organization had employed a facilitator, or 'citizen agent', to support the innovation experiments. The aim of the public service organization included creating a new kind service development model that could support the communal activities and later on be also disseminated across the city.

In planning-based innovation process, ordinary users were promoted as collaborative learning partners who ideated and tested solutions within a framework

In case A (designing the play area), the back office opened the innovation process to ordinary users (Hasu et al., 2011; 2015). In case B, the process was pursued in a more challenging and strategic development target with a limited number of users: young unemployed people and their advisors, as well as representatives of local SMEs (as potential employers).

The analysis described how in the planning-based innovation process *users were promoted as collaborative learning partners* in the innovation. The collaboration included pre-defined 'stages' but it also included the iterative nature of learning. However, users were encouraged to ideate alternative solutions within a given framework and by means ideated at the back office. The development targets included for example different themes and equipment for the play area in case A, and different modes of collaboration among the youth and the employers in case B. The users were encouraged to participate through a web platform, service design methods such as prototyping, and means of personal communication in a time period of six months. The focus was not only on the development of the content but also on the structure and time framing of the user-involvement (Alam, 2002; Alam and Perry, 2002; Strandvik et al., 2012).

The ideas produced by the users were taken as the starting point for each phase in the innovation process. The users were encouraged to collaborate boldly throughout the processes. In the planning-based innovations, systematic and long term collaborative learning relationships with the users were created. Employees and managers solved the problems together with the users and were learning *in collaboration with them* throughout the half a year processes (cf. Gottfridsson, 2010; 2012). From the provider's perspective this was valuable, because equal relationships were learned and achieved step by step in safe encounters with the help of facilitators and participatory methods adopted for example from service design.

Active facilitation of the collaboration was needed and it generated valuable structure and tools for the public service organization

The planning-based innovation model with users generated valuable structure and tools for collaborative service innovation development and its testing for the service provider. The main benefit for the public organization was related to the effects of the collaborative development style and structure where mutual respect and close relationships were learned among the professionals and practitioners (cf. Bartuk and Rynes, 2014). However, it required a considerable amount of time and effort from the providing organization and long-term commitment from the users, too. The findings indicate that the facilitation is the main mean to promote the role of the users as collaborators in innovation (Brand, 2005; Kivisaari et al., 2013). It also generated valuable structure and tools the public service organization to continue the collaborative development style.

The analysis of the cases A and B indicate that the planning-based innovation process with users seems to suit to targets where investment can also be made in the actual collaborative process. The targets refer to strategically important or ambiguous development targets where structure is needed for the collaboration to be successful. The key challenge in terms of the user's active role seemed to form around the issue on how to keep the users motivated during the long processes (Håkansson and Olsen, 2012).

In the practice-based innovation, ordinary users were empowered as innovators who decided the content and timing of the development

In the cases C and D, the development model resembled practice-based innovation processes triggered by problems in a practical context (Fuglsang, 2010; Melkas and Harmaakorpi, 2012; Orlikowski, 2002) which was opened to ordinary users (Hasu et al., 2011; 2015). The process was named as 'rapid experimenting' (Engwall et al., 2001; Toivonen, 2010).

Essential ideas underlying the cases C and D, or 'mini-pilots' as called in the city, were the *user-led nature, low bureaucracy, and right timing of the activities from the users' perspective*. The only bureaucracy needed was a one page report before and after the experiment. To the report, users we asked to outline their key ideas for the case and learnings after the case. Users were encouraged to submit their ideas through the city's web sites via a site specifically dedicated to these aims. The development and the site were done in collaboration with R&D projects.

The practice-based rapid experiments received a 'renewing resource' of 500€ if the idea was seen to be viable. The timeliness meant that users were encouraged and enabled to implement the experiment at a short notice, when a particular need was identified. Obviously, the low bureaucracy and power given to determine the content and timing of the experiment inspired many users to participate; approximately two hundred applications were received.

In the cases C and D, the active agency was given to the users for the entire innovation trajectory; from ideation to a realization of the idea. For example in case C the senior citizens took the responsibility of ideating and organizing the 'life cycle café' and in case D two young men activated people at the risk of exclusion from society by organizing a 'sports club' for them. Hence, users were *empowered as active, 'transformative' agents and responsible subjects of change in a novel way* (Haapasaari et al., 2014; Virkkunen, 2006). Users were promoted to become the service innovators and 'owners' of the processes by 'officially allowing' and supporting their active problem solving; the users were given the freedom and support to experiment.

In the cases C and D, the targets developed by the users were rather mundane and close to their daily life and interests. However, in the practice-based innovation the users took care of both ideating and providing the new service. The service production logic, resource allocation, and the relationship between the service provider and the users seemed to renew more *radically* than in the planning-based

cases (A and B). In public services, the renewal in the relationship between the actors is many times seen to be the innovation itself (Hartley, 2005).

Timely encouragement and facilitation was needed and the key learning challenge was how to learn from the users

Despite the fact that the agency for service innovation was handed over to the users, in cases C and D, the 'citizen agent's' (person employed by the city) rather informal support was still needed (cf. Kivisaari et al., 2013). Her support included discussions about the decisions in the practical contexts and help in finding relevant networking partners. The 'citizen agent's' role proved important in supporting and inspiring the users. She also mediated and 'bridged' the information to managers and to the development department in informal and in formal meetings.

The results, however, indicate that when users are promoted as service innovators by the means of practice-based rapid experimenting, more dedication and work is required of the users than of the provider. Thus, practice-based innovation required the kind of internal motivation and dedication from the *ordinary users* that is typically seen as a characteristic to lead-users (von Hippel, 1986).

Altogether, the results in Article IV support those previous findings that describe how service innovations in the public context can emerge based on both planned activities or through the change of a practice (Sundbo and Fuglsang, 2002). A contribution to service innovation discussions (e.g. Fuglsang and Sørensen, 2011) are the practical analyzes which reveal the concrete actions and activities that promoted the agency of users as service innovators. The planning-based model (in cases A and B) resembles the 'user-based' approach to innovation (Sundbo and Toivonen, 2011). In this approach the users were approached as collaborators with whom the provider learned in long term relationships. The practice-based model (in cases C and D) appeared as a 'used-led' approach to innovation (cf. von Hippel, 1986). In this approach the users were empowered to take the main responsibly from the innovation. The users became the main subjects of the development. However, in both cases the managerial commitment, facilitation and encouragement were needed (Sørensen et al., 2013).

The user-based and user-led approaches created novel learning challenges for the public service organization. The decision makers needed to take a novel kind of responsibility of learning *with and from the users*. For this purpose activities such as collaborative workshops and reflection with the users were organized. Also the 'citizen agent', facilitators, and researchers played an important role in mediating the learnings to the public service organizations.

Hence, the results indicate the important role of the managers and facilitators in encouraging the users and bridging the lessons learned to the more strategic level (Saari et al., 2015; Sørensen et al., 2013). The results contribute to the service innovation discussions suggesting that novel kind of roles and facilitating activities are needed in the public sector, in order to the user-based innovation to become systematic and strategic (Carstensen and Bason, 2012; Kivisaari et al., 2013).

5. Discussion

The aim of this thesis was to study how learning with users can take place in innovation activities of knowledge-intensive service organizations as practical and strategy-based activity. Collaborative learning between the employees and the users is a feature of knowledge-intensive services (Miles et al., 1995; Sundbo, 2000). The focus of this thesis is on collaborative learning activities that may result in service innovation.

Earlier studies on service innovation have perceived learning and the active role of users as key characteristics of innovation (e.g. Ballantyne and Varey, 2006; 2008; Edvarsson and Tronvoll, 2013; Gottfridsson 2010; 2012). However, understanding the mechanisms of collaborative learning has been deficient, and the links between innovation processes and the organization level strategic aims have been weak (Miettinen, 2002). The theory of expansive learning (Engeström, 1987) contributes to understanding the interaction between learning and innovation. However, existing research has not so far answered the questions about how users become successfully involved in learning activities and how the learning is connected to the strategic aims of the organization.

To address these gaps in the existing research, the following research question was formulated for this thesis: How can innovation activities in knowledge-intensive service organizations be understood as collaborative learning that involves a strengthening user-agency, and what are the learning challenges in the adoption of this perspective in a sustainable manner?

In this study, the learning activities with users were examined in four Articles (I–IV). The articles include four case studies (one of them with four 'sub-cases' A–D) conducted in knowledge-intensive service organizations. In the following, the research results are summarized according to three topics and four main results. First, the issue of strengthening user-agency is discussed and the main result is crystallized in the different approaches depending on whether the aim of innovation is strategy-based or practical. The strengthening user-agency refers to the involvement of users either as a 'voice' (Griffin and Hauser, 1993) or as 'active agents' in service innovation (Virkkunen, 2006). This result creates a bridge to the second topic: how innovation activities can be understood as collaborative learning including the strengthening user-agency. Here, the main result is the need to broaden the model of expansive learning into a cycle with two levels, one of them

pinpointing the user collaboration. The third topic concerns the challenges in the application of collaborative learning in a sustainable manner. Here, sustainability refers to the continuation of the collaborative learning process after the development project has ended and the facilitators have left the organization (cf. Engeström et al., 2014). The first identified challenge concerns the organizations ability to create arenas where employees can critically reflect upon the user needs and the results of practical innovation activities in a way that enables generalization and conceptual learning. The second challenge concerns the creation of managerial practices that support employees in their conceptual learning efforts, and enable the bridging of their ideas to the strategic activities of the organization. After the discussion of these three topics, a summarizing answer to the research question will be given.

In addition to the summary of the results, this chapter includes discussions about the theoretical contribution and practical implications of this thesis. The chapter also evaluates the scientific quality of the thesis and the limitations of this study. The thesis ends with the directions for future studies.

5.1 Summary of research results

5.1.1 Strengthening user-agency

The results of this thesis confirm the earlier research findings which show that knowledge-intensive service organizations have to understand users' needs to succeed in the current business ecosystem (Vargo and Lusch, 2004; 2008; Vargo, 2013). Formal feedback questionnaires do not provide sufficient understanding on these needs (Hirvonen and Helander, 2001; Magnusson et al., 2003). Organizations have to know the contexts and activities that create value for the user, perceive problems and possibilities from their point of view, and support the corresponding processes (Ballantyne and Varey, 2006; 2008; Hirvonen and Helander, 2001; Magnusson et al., 2003). This means taking part in the users' activities at the practical level and involving user input in the strategic activities of service organizations.

The results of this thesis suggest that gaining in-depth understanding of the process that creates value for the user can be achieved in several ways. The users can be involved in the innovation activities of organizations as a 'voice' or their 'active agency' can be supported. In this study, the former refers to situations where users participated either by writing an evaluation report or taking part in face-to-face learning situations. The aims of the activities were to help the service provider to see the need for change. In these situations, the users expressed their preferences and needs by their own language and priorities (Griffin and Hauser, 1993). The latter – 'active user-agency' – was enabled by the means of innovation experiments in practice. In these experiments, the users either participated in the development of the innovation or they were empowered to take the primary role

and transform the existing frames of action (cf. Virkkunen, 2006; cf. Magnusson et al., 2003).

This study identified three approaches to the development of user-agency in innovation activities. The first approach is called here *a user-driven approach*: it focuses on the mapping of user-needs with or without the participation of users to the development of the service innovation (cf. Zeithaml et al., 1990). The second approach is named *a user-based approach* and includes user participation as collaborative developers (cf. Magnusson et al., 2003; Sundbo and Toivonen, 2011). The third approach is *a user-led approach* and refers to understanding users as innovators in the front end, piloting, or after innovation phases of the process (cf. Hasu, 2001; Sundbo, 2008; von Hippel and Oliveira, 2011). Table 5 compiled within this study summarizes these approaches.

Table 5. Innovation approaches and learning relationship with users (based on this study).

Approach	User-driven	User-based	User-led
Consideration to the users	User-needs are examined	Users are collaborative developers	Users are innovators
Role of the user	Passive or active	Active	Active
Voice of the users	Mediated or direct	Direct	Direct
Learning relationship	User is the target and object of activity	User becomes a subject in the activity	User is the main subject in the activity

In the user-driven approach, the role of users can be either passive or active. When it is passive, information is collected from the users and their voice is mediated. When the role is active, users provide information or the information is interpreted with them; in this case, their voice is direct (cf. Magnusson et al., 2003; Sundbo and Toivonen, 2011). The organizational actors learn from and with the users, but the users are more or less seen as the target of activity.

The cases in Articles I and II describe the concrete activities in the user-driven approach. They describe especially the role of lead-users (von Hippel, 1986) as 'sources' of service innovations in strategy-based learning. Previous research about lead-users in the context of service innovation has been scarce (Skiba and Herstatt, 2012). In case I, the lead-users were 'inspiring actors' who evaluated the activity in a written form and inspired to take innovative actions in face-to-face

learning situations. In this way, they pushed the strategic organizational change forward. In case II, they were 'questioners' in face-to-face learning situations and helped the organizational members to perceive the shortcomings of their past activity. The users' voices were made visible and analyzed with frameworks and conceptual tools adopted from foresight (Phaal et al., 2003; Ahlqvist et al., 2012b) and developmental evaluation (Patton, 2011; Van de Ven, 2000).

In the user-based approach (Magnusson et al., 2003; Sundbo and Toivonen, 2011), the users are collaborators and active actors in the problem solving and development of innovations. Their voice is a direct input to the development. In terms of learning, organizational members develop novel solutions together with the users and users become subjects in the activity. In the case described in Article III, and in the 'sub-cases' A and B included in Article IV, the ordinary users were encountered as collaborative developers and long-term learning partners (cf. Hasu et al., 2011; 2015).

In the user-led approach, users are related to as innovators (Hasu, 2001; Sundbo, 2008; von Hippel, 1986). They are empowered as active agents, sources of ideas, and implementers of the ideas in practice. Here, users are the subject of activity and the organizational members are learning from them. The 'sub-cases' C and D in Article IV describe these kinds of user-led, practice-based innovation processes (cf. Fuglsang, 2010). They illustrate how users became empowered as innovators in practice. The empowerment was achieved by giving the users the freedom and support to experiment issues that were close to their heart and daily life. Ordinary users were the source and responsible actors in creating and testing service innovations. There are only a few previous studies that have explored how to promote the role of ordinary users as service innovators (Magnusson et al., 2003; Hasu et al., 2011; 2015).

In all of the cases, a prerequisite for the emergence of user agency was that the professionals (managers and employees) appreciated the users and saw their input valuable. That is an issue which is not self-evident but whose absence is noticed as a threat to the innovation capability and competitiveness of organizations (Herstatt, 2002; Skiba and Herstat, 2012; Sundbo, 2000).

The results of this study indicate that the adoption of a suitable approach to user involvement depends on the aims and development targets of the organization. In our cases, the user-driven or user-based approach was chosen when the aim of the development was related to the organization's strategy-based activity. The user-based approach requires investment in the actual collaborative process but provides valuable learning insights. The user-led approach was chosen when the aim of the development was local activation of the users. This approach implied the empowerment of users in issues related to their daily life. The user-led approach required that kind of internal motivation and dedication from the ordinary users that is typically seen as a characteristic of lead users (von Hippel, 1986). The results of this study regarding the user-agency can be summarized as follows:

Result 1: Lead-users can be inspirers and questioners in the search for a strategic direction in a knowledge-intensive service organization, and ordinary users can be collaborators or responsible agents in innovation by ideating and implementing service innovations in practice.

The three approaches described are not mutually exclusive (Nordlund, 2009). On the contrary, their co-existence in a knowledge-intensive service organization seems to be beneficial. Only then they can be purposefully applied based on the concrete situation, aim, and the context of service development. Therefore, the proposal of this thesis is that a dynamic view of collaborative learning and different innovation approaches with users is needed.

5.1.2 Innovation activities as collaborative learning with users

In the context of knowledge-intensive services, the user's relationship with the service provider is more intensive than in the case of products (Matthing et al., 2004; Miles et al., 1995; Sundbo, 2000). Innovation activities in this context are based on the balance between the strategic and professional interests on the one hand, and the ability to collaboratively learn and develop with users on the other (Hasu et al., 2011; Van de Ven, 2000; Sundbo, 2000). Knowledge-intensive organizations need to carry out their innovation activities together with users as systematic and efficient collaborative learning processes (Crossan and Apaydin, 2010). The results of this thesis confirm that collaborative learning with users is an integral part of innovation in knowledge-intensive service organizations.

The strong role of user collaboration in the context of service innovation creates a need to develop further the model of expansive learning by Engeström (1987). The original model includes one cycle with five phases: First, a primary contradiction causes the need for change (questioning). Second, an analysis is required in order to understand what has to be changed in the activity system in order to meet the contradiction (double bind situation). Third, an expanded object of activity needs to be constructed, which also requires re-modeling the activity system (creating a new concept of activity). Fourth, an application emerges in a process where ideas are transformed into activity. Fifth, consolidation of the new concept of activity takes place through reflection and generalization. Based on the results of this thesis, there is a need for dividing this cycle into two parts: *understanding the collaboration with users as its own cycle*. Thus, this thesis suggests *a 'two-level learning cycle'*. This cycle is presented in Figure 11. It is important to note that even though the number of phases in the 'two-level learning cycle' is the same as in the newer model by Engeström (2001), the idea of supplementation differs. Here, the main point is making the user involvement visible whereas Engeström specifies the role of the model and its reflection (ibid.).

The 'two-level learning cycle' (Figure 11) includes two kinds of learning processes and two kinds of innovation perspectives. The upper cycle includes the strategic orientation to innovation and learning and is called as the 'strategy-based organizational learning cycle'. The lower cycle describes a change in the practice

of innovation and learning, and is named as the 'practice-based learning cycle'. The two cycles meet at the conceptual level. On this level, the strategic analyses are summarized into a 'learning hypothesis' applicable in practice, and correspondingly, the practical experiences are reflectively analyzed to become generalizable (cf. Dewey, 1910; Miettinen, 2000). The whole learning cycle includes seven phases, and it may start either from the strategic perspective to innovation or from an innovative change in a practice. The learning process which starts from the strategic perspective (top-down) is indicated with grey arrows. The learning process which starts from a change in practice (bottom-up) is indicated with black arrows. All arrows are two-directional to highlight the non-linear nature of the cycle: the phases are overlapping, and there are sidesteps and returns to the former phases. In the following, the learning process which starts from the strategic perspective is described in more detail (the corresponding process which starts from a change in practice is referred to in the respective points).

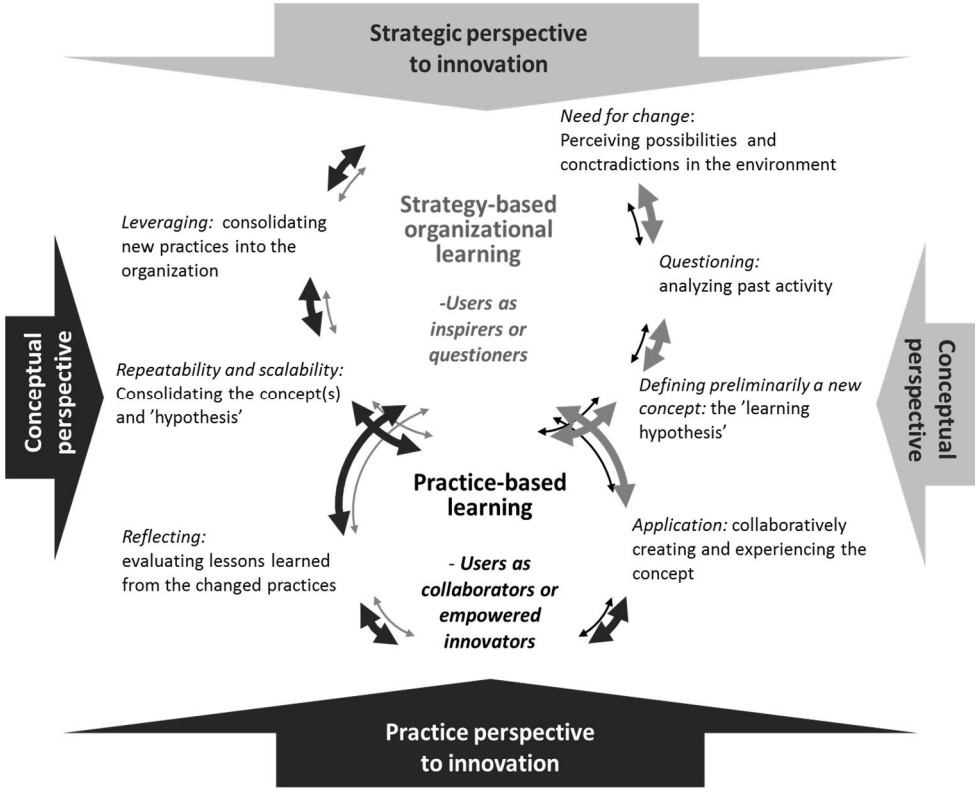

Figure 11. Two-level organizational learning cycle for conceptualizing and enabling service innovation with users (based on this study).

Strategy-based organizational learning cycle starts from the *need for change*. This means perceiving possibilities and contradictions in the environment and takes place in collaboration between managers, employees and lead-users. The purpose of this phase is to understand the larger 'landscape' and identify influential trends (cf. von Hippel, 1986; Skiba and Herstatt, 2012). Foresight tools can be used for the identification of these external prerequisites of innovation activities (Ahlqvist et al., 2012a; Phaal et al., 2003).

The next phase includes *questioning the past activity* in order to understand the current contradictions and shortcomings in more detail (Engeström, 1987). For this purpose, learning tools adopted from developmental evaluation (Patton, 2011), and the concept of impact of activity (Lähteenmäki et al., 2006; van de Ven, 2000), were found beneficial. They enable the actors to make visible the results and the impact of their work from the perspectives of multiple users. Lead-users in particular can be utilized as questioners in perceiving the shortcomings of the past activity. Here, it is important to find the suitable unit of work to be evaluated; in the case of knowledge-intensive organizations, these units are often projects which represent the locus of innovative ideas.

On the basis of future trends in the environment and the analysis of the organization's own history, a fertile ground has emerged to motivate the change. The next step is to define *preliminarily a new concept of activity as a 'learning hypothesis'* (Dewey, 1910). It refers to the new direction and conceptual descriptions that help to concretize that direction. In the cases of this study, a 'learning hypothesis' meant, for example, explicating and writing down the first fragile ideas for innovation concepts. These concepts were later on experimented and modified together with users in practice. Facilitators and managers can help the employees to clarify their ideas into new concepts which also represent 'the spear-heads' of the strategic aims in practice.

The next phase, *application*, means entering the practice and includes the start of *practice-based learning cycle*. It is the fourth phase of development if the process has been initiated as strategy-based. However, as mentioned above, it is also possible that the starting point of innovation is in practice (cf. Toivonen, 2010), and in this case, this phase activates the whole two-level learning cycle other way round. The phase consists of changing practices, practical problem solving, experimenting and iteratively learning together with users (cf. Dewey, 1910; Fuglsang and Sørenson, 2011). The core in this phase is application: testing novel concepts, capabilities and roles together with users. The application can be based either on planned procedures (Alam and Perry, 2002; Gottfridsson, 2010; 2012) or on more experiential approaches (Engwall et al., 2001; Toivonen, 2010).

The practice-based learning cycle also includes another important phase: *reflection.* (It is the fifth phase in a cycle which has started from the strategy and the second phase in a cycle which has started from a change in practice.) Here, the results of the practical experiments and other applications are reflected upon together with the users (cf. Dewey, 1910). Reflection may open up either a new advanced experiment or the changed practices may be conceptualized as recurrent activity patterns. Reflection is important as it enables generalizing and inte-

grating the results of practice-based learning to the conceptual and organizational levels (Engeström, 1987).

The next phase means a transfer back to the 'strategy-based learning cycle'. (It is the sixth phase in a cycle which has started from the strategy and the third phase in a cycle which has started from a change in practice.) In this phase, the *repeatability and scalability* of the new concepts are evaluated. A degree of formalization is required: the core elements or the 'stem cell' of the novel practice has to be identified in order to communicate the experiences and make them transferable in a wider context (Dewey, 1910; Fuglsang and Sørenson, 2011; Hasu and Fuglsang, 2013). These activities can be described as 'conceptualization efforts': they require the articulation of key characteristics of the 'concept-in-the making' (Engeström et al., 2014). Conceptualization can be seen as an important step at the 'hypothesis level' of learning (Dewey, 1910).

The last phase includes *leveraging and consolidation of the lessons learned*. (It is the seventh phase in a cycle which has started from the strategy and the fourth phase in a cycle which has started from a change practice.) Leveraging and consolidation include concrete efforts (negotiations and decision making) to apply the changed practice and new concept of activity in other areas in the organization. In this phase, it should be decided how the learning cycle may be sustained in the organizational practices and how it can be diffused to other activity systems in the organization (cf. Crossan et al., 1999; Engeström, 1987).

If a process has started from a change in practice, it continues hereafter to the analysis of the linkages that the individual change may have to the organization level change needs and the evaluation of the organizations past activities. Often an individual change may be a symptom of important broader issues that have to be considered first at the strategy-level and then formulate into new 'learning hypotheses'. Thus, irrespective of the starting point of the learning cycle, a new cycle usually starts after the completion of the former cycle, and in this way the development continuously fosters the emergence of service innovations together with users. The two-level learning cycle summarizes the second main result of this study:

Result 2: Innovation activities can be conceptualized as collaborative learning with users when they are pursued in an expansive and reflective manner. Conceptual reflection enables to bridge practice-based learning to the strategic aims of the organization.

The above described, two-level organizational learning cycle has similarities with the service innovation model described by Sørensen et al. (2013). Their model (see also Sundbo and Fuglsang, 2002) describes how ideas for innovations derive from multiple sources in a service organization. The impulses of users are communicated to the organization by grassroots employees in different practice- or planning-based processes. Also managers and the strategy are seen as important sources of innovation. The authors suggest that managers should stimulate and facilitate employee creativity and integrate the results of that creativity (service

innovations) to the organizational goals and routines. The cycle presented above supplements these views with an analysis of the phases in which the different tasks are realized. It focuses on the ways in which collaboration – with users in particular – takes place, and on the ways in which mutual learning can be fostered. It also combines the theory on strategic reflexivity (Sundbo and Fuglsang, 2002) and the theory of expansive learning (Engeström, 1987) by describing the organizational learning activities which enable the merging of the top-down and bottom-up perspectives in service innovation. It creates a model for conceptualizing collaborative learning as a way to continuously enhance service innovations with users.

5.1.3 Challenges in applying collaborative learning with users in a sustainable manner

In this study, the ability to learn in expansive (Engeström, 1987) and reflective manner (Dewey, 1910) was proven to be essential for the entire personnel of knowledge-intensive service organizations and to be relevant with many kinds of users. Hence, it is important that knowledge-intensive organizations learn to carry out their innovation activities together with users as sustainable learning processes also after individual development projects have ended and the facilitators left the organization (cf. Crossan and Apaydin, 2010; Engeström et al., 2014).

The research results indicate that the pursuing for collaborative learning in an expansive and reflective manner requires *situations and arenas* where to collaboratively reflect the needs of the users and to experiment novel activity with the users in practice. In this study, collaborative learning workshops and tools were needed for this purpose. They enabled the critical evaluation of the practical experiences as abstract and recurrent activity patterns (cf. Dewey, 1910; Engeström et al., 2014; Crossan et al., 1999).

In the cases studied, the *facilitators organized* collaborative learning workshops which aimed at expansion in the object of activity and reflection between employees, managers and users. In the workshops, employees and managers from different positions came together. During the first phases of the 'strategy-based organizational learning', the different viewpoints of users were reflected by analyzing them. Facilitators offered different conceptual learning tools to help to analyze the users' views. For example, the roadmapping tool (Phaal et al., 2003) was used to combine the different perspectives into a shared vision in the service research network. Also the conceptual learning tool modified based on a model of applied research (Van de Ven, 2000, p. 14) and impact of activity (Lähteenmäki et al., 2006) proved important for the employees to interpret and make structure of the 'users' voices' (Virkkunen and Ahonen, 2011).

In 'the practice-based learning', reflection was also organized by the facilitating actors and was present in multiple ways. For example, in a planning-based experiment, a prototype exhibition (e.g. Saco and Goncalves, 2008) in the city library offered the citizens a possibility to experiment the novel solutions and reflect their experiences. The exhibition included a possibility to post feedback to the social

media platform, or to discuss with the facilitators and the service provider face-to-face. After the experiments had been ended, their results were reflected both with the users and internally in the knowledge-intensive service organizations. The conceptual reflection criteria in the practice-based experiments were formed from the strategic aims of the organizations.

The results of this thesis indicate that, in order to conceptualize and perceive recurrent activity patterns, the user's needs and results from practice-based experiments need to be reflected, interpreted and refined in an organization. Thus, the first learning challenge that this study revealed in the adoption of collaborative learning in a sustainable manner is the following.

Result 3: It is crucial and challenging for the organizations to create arenas were employees can critically reflect upon the user needs and results of the practical innovation experiments in a way that allows generalization and conceptual learning to take place.

The capability to make generalizations about experiences requires collaborative reflection in an organization where 'an abstraction is made from the everyday routine' (cf. Fuglsang and Sørensen, 2011). Recent innovation studies applying the concept of 'bricolage' have paid attention to this challenge (Fuglsang and Sørenson, 2011), and more in-depth understanding about the collaborative reflection processes can be found in the theories of organizational learning (e.g. Crossan et al., 1999; Crossan and Berdrow, 2003; Engeström et al., 2014). The theory of expansive learning (Engeström et al., 2014) calls this challenge as 'ascending from the abstract to the concrete'. A novelty in this thesis, compared to the previous studies, is that it concretized how this generalization can be done with the help of learning workshops and tools modified from roadmapping (Phaal et al., 2003) and developmental evaluation (Patton, 2011; Van de Ven, 2000). The ability to generalize is a vital step for turning fragile experiences into organizational learning and service innovations.

To support employees in conceptual learning efforts, the collaborative learning situations with the managers were proved to be important. The results of this thesis indicate that the emergence of service innovations through collaborative learning with users requires that expansive (Engeström, 1987) and reflective learning are valued both in the organization's everyday practices and in the managerial practices. The managerial practices should facilitate collaborative learning and link its results to the organization's strategic activity (cf. Sørensen et al., 2013). A second learning challenge that this thesis points out is the following:

Result 4: Creating managerial practices that support employees in their conceptual learning efforts and enable the bridging of their ideas to the strategic organizational activity is crucial and challenging.

To summarize the answer to the research question, this thesis argues that innovation activities of knowledge-intensive service organizations can be conceptualized

as collaborative learning with users when they are pursued in an expansive and reflective manner. Conceptual reflection enables to bridge the practice-based learning to the strategic aims of the organization. The main challenges in the adoption of collaborative learning in a sustainable manner consist of two issues in particular. The first challenge is to learn to create arenas were employees can critically reflect upon the user needs and results of the practical innovation experiments in a way that allows generalization and conceptual learning to take place. The second challenge is the creation of managerial practices that support employees in their conceptual learning efforts, and enable the bridging of their ideas to the strategic organizational activity.

5.2 Theoretical contributions

From a theoretical point of view, this study contributes to the deepening *interface of service innovation and organizational learning* studies by examining, reviewing, and summarizing how learning with users can take place in innovation activities of knowledge-intensive service organizations as practical and strategy-based activity. The theoretical framework in this study can help to integrate relevant perspectives for the further development of service innovation and organizational learning theory to perceive these collaboration activities as practice- and strategy-based. More specifically, the topic required integrating four perspectives (Figure 1, p. 6). The first perspective included collaborative innovation processes with users. In the second perspective, expansive learning formed the core. The third perspective focused on foresight and evaluation as conceptual tools and frameworks to enable the analysis of the environmental 'landscape' of innovation activities as a strategy-based issue. The fourth perspective concerned the empirical context – knowledge-intensive organizations as service innovators.

The theoretical analysis in this thesis has shown that the interaction between top-down and bottom-up approaches (between the strategy and practice with users) is of utmost importance to the emergence of service innovations. Previous *service innovation studies* by Sørensen et al. (2013) and Sundbo and Fuglsang (2002) have emphasized this importance, but have not focused on analyzing the phases in which the different activities are realized. This study proposes a 'two level-learning cycle' for conceptualizing knowledge-intensive service organizations' innovation activity as collaborative learning in a way that enables a deepening user-agency and joint value creation. The connection of the theories of expansive learning (Engeström, 1987), reflective thought and action (Dewey, 1910) and user-based service innovation (e.g. Alam and Perry, 2002; Magnusson et al., 2003; Sundbo and Fuglsang, 2002; Sørensen et al., 2013; Toivonen, 2010) provided principles how to conceptualize and analyze innovation activities as collaborative learning activity with users.

The second theoretical contribution of this study to *service innovation* discussion is the analysis of the concrete learning and innovation activities together with users. In the theoretical service innovation literature, user involvement is often

described as a rather abstract concept (Magnusson et al., 2003). A contribution to the user-based service innovation discussion is made by describing how the role of users as the service innovators can be promoted in practice (cf. Fuglsang, 2010; Hasu et al., 2011; 2015) and what kind of learning relationship the different innovation approaches to users entail. In the user-driven innovation approach, the user is the target and object of the activity. It means that organizational actors learn either from or with the users. In user-based and user-led approaches, the user becomes a subject and 'transformative agent' in the development of service innovations (cf. Virkkunen, 2006; Magnusson et al., 2003). In the studied cases, the 'transformative agency' meant that ordinary users took actively part or were the main actors in innovation. The user-driven and user-based approaches seem to be suitable to strategic and general development targets, whereas the user-led approach is suitable to concrete development targets close to the heart and daily life of the users. The user-led approach seems to require that kind of internal motivation and dedication from the ordinary users that is typically seen as a characteristic to lead users (von Hippel, 1986). The combination of the user-based service innovation discussions to the expansive (Engeström, 1987) and reflective learning (Dewey, 1910) enabled to create a framework to explain how the strengthening user-agency can be conceptualized and realized in practice in knowledge intensive service organizations. Together they enabled to create the 'two-level learning cycle'.

In organizational learning literature, the challenge has been how to combine learning from the past with future actions and learning between individuals, groups, and organizations (Crossan et al., 1999; Fiol and Lyles, 1985; March, 1991). Many traditional organizational learning studies have focused on knowledge exploitation and minor changes in activity, instead of studying discontinuous, qualitative changes and the exploration of a plausible future (cf. Ahonen, 2008; Crossan and Apaydin, 2010; Knight, 2002; Lyles and Easterby-Smith, 2003). Moreover, what is often missing in the traditional organizational learning models is their empirical testing and descriptions (Crossan and Berdrow, 2003; Lähteenmäki et al., 2001). This thesis contributes to organizational learning studies by theorizing and studying in practice how to perceive and promote learning as *strategy- and practice-based innovation activity* together with users. Connection to the frameworks of foresight (Ahlqvist et al., 2012b) and evaluation (Patton, 1997; 2011) provide the contribution to the former and connection to the user-based service innovation discussions to the latter. Roadmapping (Phaal et al., 2003) and developmental evaluation (Patton, 2011; Van de Ven, 2000) provided valuable conceptual tools to tackle in practice the challenge of 'ascending from the abstract to the concrete' (cf. Engeström et al., 2014).

A more specific implication to *the theory of expansive learning* (Engeström, 1987; 2004; 2007) is the extension of the original expansive learning cycle to the 'two-level learning cycle'. The strong role of user collaboration in the context of service innovation created the need to develop further the original learning model. Based on the results, the cycle was dived into two parts: understanding the collaboration with users as its own cycle.

5.3 Practical implications

From the practical point of view, the results of this thesis support the previous service innovation studies (Saari et al., 2015; Sørensen et al., 2013) suggesting that successful organizing of service innovations requires both the bottom-up strategy (empowerment) and the top-down strategy (managerial direction). An important question is how to create a balance between these strategies and how to enable them to meet. From the practical point of view, the first contribution of this thesis is the increased *awareness of collaborative learning with users in innovation activities of knowledge-intensive service organizations* and *the activities, actors and tools* that enable the merging of the perspectives. In practice, the results demonstrate how innovation activities can be organized as continuous and collaborative learning cycles. Via these cycles organizations can learn both 'something which is not yet existing' (expansion) and learn 'from a change in practice' (reflection). It requires the managers to come physically together with the employees and users to foresight the future and evaluate the past activity when creating the strategic aims. The empowerment means here the encouragement of the employees and users to innovate and experiment their ideas in practice. When services are designed in collaboration, it is ensured that the real needs of the users meet the aims and production processes of the provider. Empowerment ensures the right timing of the development and, in practical terms, means allocating resources and social recognition to the user-based development.

Empowerment creates demands to *the employees*. They need to take responsibility for their development and creativity. The findings of this thesis support the previous findings (Sørensen et al., 2013) suggesting that 'social intelligence' in everyday work practices will become increasingly important. It means that the employees need to have the willingness to develop their own work practices and be sensitive enough to detect valuable ideas from the user-interaction. From employees, this requires a commitment to their work and a genuine willingness to cooperate with the users. Furthermore, it requires sharing the insights from the grassroots with the organizational managers who, in their turn, can help the employees to turn the ideas into innovations and official ways of working. In learning organizations, employees need to be 'reflective practitioners' (Schön, 1983) who constantly reflect upon their activities and their consequences.

For *top managers and policy makers*, who are planning reforms and are interested in improving innovation capability in organizations, the findings imply that the managerial focus should be placed on supporting variety and quality of collaborative learning situations in and between organizations. Hence, the top managers and policy makers should promote structures, conditions and practices that allow constant learning, collaborative experimenting and having a reflexive stance towards the environment (cf. Dewey, 1910; 1938; Fuglsang and Sundbo, 2005; Sørensen et al., 2013). The structures should aim for low hierarchy and bureaucracy, high flexibility and information sharing, and visualization of that information as it is easier to understand and interpret. The organizational conditions should encourage for entrepreneurial values and user-centered ways of working. It means

that managers need continuously collaborate and learn with the employees and users, trust their capabilities and allow employees to design their work practices. The organizational practices, in turn, concern supporting informal and formal learning among the actors. The informal learning practices should encourage for unplanned encounters between people, daily problem-solving, questioning, experimenting, and even failing. They can be supported by encouraging overall innovativeness in an organization, allocating resources for favorable experiments and training, and for example, by organizing the office spaces accordingly. The formal learning practices refer to organized events such as workshops including people from different positions and organizations. They are useful in various phases of the innovation processes (when planning or evaluating innovation activities). In the workshops, learning experiences from the practice-based experiments can analyzed, and it can be discussed which ideas from the 'grassroots' will be chosen to develop further as official ways of working (cf. Hasu et al., 2015; Sørensen et al., 2013).

Different *tools* from foresight (Bell, 2003; Phaal et al., 2003) and evaluation (Patton, 1997; 2011; Van de Ven, 2000) are helpful in providing structure for strategic learning situations and workshops. They enable to perceive the shortcomings and possibilities of individual insights and learning experiences on a conceptual level. Service design, in turn, provides valuable tools to communicate and collaborate with users in the practical activity. In the practical innovation experiments of the thesis, service design tools, such as visualization and prototyping (Saco and Goncalves, 2008; Samalionis, 2009), proved useful. Visualization brought tangibility to the development by translating abstract ideas and service concepts into concrete interpretations. Early-phase prototyping enabled to rapidly and economically test the content of the concepts (ibid.). This way the different options were easier to understand and evaluate.

The second contribution from the managerial point of view deals with the discussion of *the responsibility of organizing and supporting* collaborative innovation activities. In the studied cases, the responsibility of planning the innovation-oriented learning processes, suitable tools, and arenas was mainly 'invisible work' and the liability of the researchers or external facilitators. These actors, though supported by the management, took the responsibility of facilitating the complex learning processes and helped to integrate the learning into the organizations in different R&D projects. Hence, one can ask that is the important role of facilitating and supporting the learning from local innovation experiments as a strategically important activity forgotten or 'outsourced' in the time-period of efficiency and productivity? Organizations' learning and innovation capability is a strategically important issue especially in knowledge-intensive service organizations (Crossan et al., 1999; Miles et al., 1995, Sundbo and Fuglsang, 2002; Toivonen and Tuominen, 2009). It cannot rely on outside actors and external funding.

The results of this thesis suggest that enabling collaborative learning with users for the purpose of service innovation requires managerial dedication, novel managerial practices and facilitative approach especially from *the middle managers* (cf. Floyd and Wooldridge, 1997). These actors are typically in between the strategic

planning and everyday activity of the employees and users. The task and new capability of the middle managers then becomes to encourage, coordinate, and integrate collaborative learning via the formal and informal organizational learning practices (such as the workshops among people) (Ahonen, 2008). To support the middle managers in this task, it is also possible to create *novel facilitative roles* into the organizations. Those facilitators can help the managers and take responsibility from enabling and coordinating such activities. Either way, collective and sustainable learning arenas at multiple levels are needed. Only then individual insights and changed practices can be integrated into the organizational learning and transformed as service innovations (cf. Toiviainen 2003; Saari et al., 2015).

5.4 Evaluation of the study

The methodology used in this study is qualitative case study. The case study approach was chosen because it is well suited to study a contemporary phenomenon that is not yet fully understood (Yin, 1994). The main research questions addressed are 'how' questions in order to understand and describe phenomena. Action research was applied in the case studies. The researchers participated actively in the development workshops and meetings that were studied. This kind of empiricism is justified when the focus is on social phenomena in a context (Barley and Kunda, 2001).

Reliability and validity are used in evaluation of a study. Yin (1994) defines that validity includes: identifying correct operational measures for the concepts being studied, seeking to establish a causal relationship, and defining the domain to which a study's finding can be generalized. Reliability refers to the repeatability of the research process with the same results (ibid.).

Qualitative research approaches are sometimes criticized to be subjective and difficult to replicate (Bryman and Bell, 2011). The criteria to evaluate quantitative research may not be applicable to evaluate qualitative research. Reliability is a poor measure to evaluate qualitative research because repeatability and consistency of the measurement is not often reasonable in social sciences (Bryman and Bell, 2011; Guba and Lincoln, 1994; Järvensivu and Trönroos, 2010). The most important criterion to evaluate qualitative research is considered to be the trustworthiness and validity of the research (Guba and Lincoln, 1994).

Trustworthiness and validity in a qualitative research is suggested to be evaluated by Guba and Lincoln (1994) in terms of *credibility, transferability, dependability and conformability*. Credibility refers to the believability of the results. It can be ensured by carrying out research of good practice, describing the researcher's position in the study, and submitting the findings to the members who were studied for assuring the correct understanding. Transferability refers to the applicability of the findings to other contexts and dependability to the applicability of the findings at other times. Credibility and transferability can be strengthened by thick descriptions of the research process and results. Conformability refers to the pos-

sibility of researcher's values tangling to the research (Guba and Lincoln, 1994). This study is evaluated by the criteria suggest by Guba and Lincoln (1994).

The intention of this thesis is to deeply investigate the learning and innovation activities with users. In the cases, the development targets were discussed together with the participants, in multi-voiced groups and, in real life situations. The involvement in the developed activities offered the researcher a possibility to examine the activities from process-oriented perspectives in real life settings (Engeström, 1987; 2004; 2007, Lounsbury and Crumley, 2007). The researcher's position in each study was reported both in the Articles (I–IV) and in the methodological part of this thesis. In addition, the findings of the cases were discussed with the researched ones during the research process for assuring the correct understanding. The Articles were also sent for approval to the researched ones prior the publishing.

The credibility of the results was improved during the research process by triangulation of multiple research methods (Jick, 1979). Triangulation was used to capture the dynamics of the real life learning and innovation activities and avoid distortion due to a single method (ibid.). The activities were video-recorded, observed, or both. Researchers made fieldwork memos from the dynamics of the activities and critically reflected their findings first individually and with each other. In addition, theme interviewing of the participants supplement the methods. In the interview situations researchers made questions from multiple angles. They captured the nature of the processes and the outcomes. At the interview situation the researchers gave an opportunity for the interviewees to reflect on the activities. Researchers also brought illustrative material from the studied activities, such as slideshows to the interview situation. The purpose was to refresh the memory of the interviewed and to set her to the context of the studied activity. By these methods researchers gained rich and deep understanding of the learning and innovation dynamics (Yin, 1994) and improved the credibility of the results.

The transferability of a study to other contexts and applicability of the findings at other times can be strengthened by thick descriptions of the research process and results (Guba and Lincoln, 1994). Thick descriptions in this thesis include reporting how the reasoning and research processes have evolved, under which conditions the case studies took place and which were the details of the studied activities.

The reasoning process of this study was abduction (Dubois and Gadde, 2002; Paavola and Hakkarainen, 2005; Tronvoll et al., 2011). The abductive reasoning was applied in each case presented in the Articles (I–IV) and in the summary part of this thesis. The abductive process enabled to gradually deepen the understanding of the dynamics of the activities in the service innovation context. Each article offered the researcher a complementary window to understand the research phenomenon and increased her knowledge cumulatively article by article. The strength of this process was that it enabled to create more thorough picture both theoretically and in practice about the studied phenomena than any snapshots of reality, such as conducting a survey in a specific time period would had provided.

Also, the research data was analyzed by the means of abduction. Qualitative content analysis (Elo and Kyngäs, 2008) was utilized to find meanings from the

text or speech by the systematic classification of data. The prior knowledge influenced the issues that were sought in the texts and in the speech on the videos (such as certain phases of the collaboration and the ways in which the 'voice of the user's' was present in the learning situations). Hence, the first analysis round resembles deduction but it also was combined to include inductive analysis. New analysis categories were created inductively when novel issues emerged from the data. The abductive processes of this thesis are described in-detail in the methodological part.

The details of the studied activities and conditions under which the activities took place are also described in each Article (I–IV) and in this thesis. The thick descriptions included the cultural-historical context of the cases and the topical learning challenges. Those descriptions intend to provide the reader with understanding of the motives for learning in each case. Also the actors and their roles in the studied activities were described in-detail. The expansive learning (Engeström, 1987) approach offered the researcher analytical means to explore, in a nuanced way, the emergence of the learning and innovation activities. It offered valuable theoretical and practical tools, such as the activity system and the learning cycle. It gave the first principles how to conceptualize and analyze innovation activities with users in knowledge-intensive service organizations. However, too far-reaching conclusions should be avoided based on the results. The applicability of the findings in other organizational contexts, cultures, and other times should be studied further.

Guba and Lincoln (1994) describe how conformability refers to the possible tangling of the researcher's values to the research. In action research, the researcher becomes part of the community under study. Hence, the researcher's position is not solely a passive observer but includes elements of a co-developing actor. Based on this, action research approaches are criticized from the potential risk of the researcher to lose the critical perspective (Johansson and Lindhult, 2008). To keep the critical perspective, the researcher aimed at a high degree of self-awareness in the cases studied. In every case, it was clear from the beginning that the material produced would be later on used for scientific purposes. Hence, the researcher conducted a good scientific practice throughout the processes. She utilized multiple research methods and analyzed the material carefully and critically. The researcher made sure the accuracy of the interview transcripts by checking that they corresponded to the interview tapes and the notes made in the interview sessions. To make sure the accuracy of the transcripts, the content of the analysis documents and the fieldwork memos were discussed by co-authors.

The main limitation of this study is the level and perspective of analyzes. The service organization has been the main focus of the analysis, whereas deeper user perspective could have been included. The literature about networks and partnerships might have been relevant too. Additionally, the cases involved the active participation of the researchers. Studying the phenomena without active involvement and interventions might have provided different results. In all, this thesis provided in-depth knowledge about collaborative learning with users in service innovation but also opened up new questions for further research.

5.5 Suggestions for future research

In this thesis, the theory of expansive learning (Engeström, 1987), supplemented with the theory of reflective thought and action (Dewey, 1910), was used to understand the organizational learning processes for service innovation. This thesis is based on the presumption that more comprehensive conceptual learning models are needed to trigger innovation as strategic issue (Crossan et al., 1999; Crossan and Berdrow, 2003; Zollo and Winter, 2002). The challenge with the learning is that it should have a link to practical user interaction (Greer and Lei, 2012; Sørensen et al., 2013). This thesis tightened the link between service innovation and organizational learning studies by focusing on the ways how user collaboration takes place and strengthens the innovation activity of knowledge-intensive service organizations. The results of this thesis confirm that collaborative learning with users is an integral part of innovation activities in knowledge-intensive service organizations.

Based on the theoretical and empirical analyzes, this study created a 'two-level organizational learning cycle' to conceptualize, organize, and analyze innovation activities as collaborative learning processes with users. It suggests that the collaboration with users should be perceived as its own cycle. In future studies *the model created could be applied* to different service organizations. It would be also interesting to apply it to different industries, cultures, and innovation contexts. For example, it would be interesting to test whether the model would work in the creation and implementation of novel technologies or even more complex network settings. From theoretical perspective, the model could be made more robust by continuing its theoretical advancing.

For future studies, the combination of service innovation and organizational learning discussions provides potential conceptual and practical frameworks to understand the social aspects in innovation activity. They also provide insights into the transition mechanisms toward service and user orientation in organizations. However, *the link between service innovation and learning theories could be made even stronger*. This means that more studies on organizational learning related to service innovation, provider-user collaboration, networked development, and different innovation approaches are needed. Studying how service innovation takes place and is experienced from multiple user or network perspectives would benefit from future research.

One interesting research avenue would be to examine the issue of *trust building* in collaborative innovation activities. In the results, it became clear that the collaboration required trust and openness among the actors; both the managers needed to trust the capabilities of the employees and users, and the employees and users needed to trust the initiatives of the managers. Lusch et al., (2010) have identified the lack of trust as an impediment to innovations. On the other hand, profound trust can be expected to increase commitment, which seemed to be needed in the innovation efforts.

It would be interesting to examine in which ways organizations could best *motivate, support, and encourage* different kinds of users and employees to innovate.

To keep the users motivated in long term learning processes seemed challenging in some of the cases studied. Hence, it would be interesting to understand better what drives actors, especially ordinary users and employees, to create novelties for themselves and for the benefit of the service provider.

The above mentioned issue comes close to suitable *incentives and performance measures* which can enhance the innovation climate in knowledge-intensive service organizations. Traditional incentives and performance measures of these organizations originate in science and technology 'world' and according quantitative indicators. However, service innovations result from complex social behavior and are not able to be captured by the traditional performance measures and indicators (Djellal and Gallouj, 2013; Hyytinen et al., 2014). Hence, studies related to incentives and evaluation criteria which take better into account the social and systemic nature of service innovations would be needed.

This thesis also brought more evidence to the fact that service innovation may start from top-down and planned activities but also un-planned from the employees or users (Sundbo, 2000; Sørensen et al., 2013). Despite many service innovations occur without the perception of managers at the grassroots, this thesis showed how in many cases employees and users benefit from delicate encouragement to innovate. Especially, employees might not always recognize or find the suitable time or forum where to bridge their innovative ideas or service experiments into the strategic activities of the organizations. Hence, different bridging actions, support, and generalizing activities of the managers and other facilitators seem to be needed (cf. Hasu et al., 2015; Kivisaari et al., 2013; Saari et al., 2015). The different *bridging actions and novel roles needed* to support the issues would benefit from future research.

One interesting research avenue would also be to examine how *the conscious use* of different service innovation and learning approaches could support systemic changes at organizational and societal levels in the long run. In the second case city of the Article IV, the service provider supported the creation of approximately hundred practice-based experiments with users. The user-led development approach was integrated into the management practices of the public service organization, but how this kind of development could be diffused to the public service development more generally, would benefit from future research (cf. Albury, 2005; Smith and Fischbacher, 2005). An important area of future research is the *institutionalization and diffusion* of service innovations. The potential of different hybrid actors and users in diffusing the innovation practices would be an important area to study.

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ARTICLE I

Towards co-creation of service research projects: a method for learning in networks

International Journal of Quality and Service Sciences,
Vol. 2, No. 1, pp. 128–145.

ARTICLE II

Developmental impact evaluation for facilitating learning in innovation networks

American Journal of Evaluation,
Vol. 32, No. 2, pp. 227–245.

ARTICLE III

Learning about service-orientation in KIBS: understanding the customer as an active actor

Service Science, Vol. 6, No. 2, pp. 78–91.

ARTICLE IV

Co-innovating in public services: planning or experimenting with users?

The Innovation Journal:
The Public Sector Innovation Journal,
Vol. 18, No. 3, pp. 1–16.

Series title and number

VTT Science 110

Title	**Collaborative learning with users as an enabler of service innovation**
Author(s)	Katri Kallio
Abstract	In today's economies, innovations increasingly concern new services and social issues. These kinds of innovations are only rarely created via in-house research and development; more often they emerge in the inter-organizational collaboration with different actors. The importance of the active role of users is recognized and learning has been emphasized as a key process of innovation. However, deeper knowledge about the relationship between learning and innovation is still scarce, and this concerns knowledge-intensive service organizations, among others. This thesis aims to provide new scientific knowledge about collaborative learning in the context of service innovation. It focuses on the activities and practices in which collaboration – with users in particular – takes place and on the ways in which mutual learning can be fostered. The theoretical starting point of this thesis is the theory of expansive learning. It describes how organizations can learn to renew their activity in a cyclical manner by perceiving current contradictions in their activity and by creating a new concept of activity to meet shortcomings in practice. In this thesis, the theory of expansive learning is supplemented with the user- and strategy-based innovation literature to enable its application for the analysis of collaborative learning experiments. Hence, this thesis utilizes theories that strengthen both the bottom-up and the top-down perspectives in learning and innovation. The context of the study is knowledge-intensive service organizations. Concrete activities and practices to co-develop services with users were examined via four case studies in public and private organizations. The methodology of the thesis is qualitative and the case studies were carried out with an action research approach. The empirical material was collected by observations and interventions concerning innovation activities; theme-based interviews of the key developers supplemented the material and focused on the innovation processes and their results. The key finding is that collaborative learning with users is an integral part in innovation activities of knowledge-intensive service organizations, and supports the bridging of the top-down and bottom-up innovation activities if it is pursued in an expansive and reflective manner. This includes understanding the needs of users and the collaborating with them in value creation. More specifically, lead-users can be inspirers and questioners in the search for a strategic direction, and all kinds of users can be collaborators or responsible agents who ideate and implement service innovations in practice. Based on these findings, the thesis supplements the model of expansive learning to include: the strengthening of user-agency at the strategic level by means of evaluation and foresight, and the creation of novel activity at the operational level by experimenting with users in practice. This new conceptual model is presented as a 'two-level learning cycle'. The most important theoretical contribution of the thesis is the construction of connections between the research into service innovation and the research into organizational learning. It includes the description of concrete learning activities to enable service innovation with users, and a model based on these activities. As a practical contribution, the results highlight the importance of enabling collaborative learning experiments and their critical reflection.
ISBN, ISSN, URN	ISBN 978-951-38-8350-8 (Soft back ed.) ISBN 978-951-38-8351-5 (URL: http://www.vttresearch.com/impact/publications) ISSN-L 2242-119X ISSN 2242-119X (Print) ISSN 2242-1203 (Online) http://urn.fi/URN:ISBN:978-951-38-8351-5
Date	November 2015
Language	English, Finnish abstract
Pages	139 p. + app. 75 p.
Name of the project	
Commissioned by	
Keywords	service innovation, organizational learning, expansive learning, collaboration, experimenting, users, knowledge-intensive services
Publisher	VTT Technical Research Centre of Finland Ltd P.O. Box 1000, FI-02044 VTT, Finland, Tel. 020 722 111

Julkaisun sarja ja numero

VTT Science 110

Nimeke	**Yhteistoiminnallinen oppiminen käyttäjien kanssa palveluinnovaatioiden mahdollistajana**
Tekijä(t)	Katri Kallio
Tiivistelmä	Innovaatiot koskevat yhä useammin palveluja ja sosiaalisia kysymyksiä ja edellyttävät yhteistyötä useiden toimijoiden välillä. Käyttäjälähtöisyys, käyttäjien aktiivinen rooli ja oppiminen heidän kanssaan on tunnistettu merkittäviksi tekijöiksi palveluinnovaatioiden synnylle. Kuitenkin syvällistä tutkimustietoa käyttäjien kanssa tapahtuvasta oppimisesta ja sen suhteesta palveluorganisaatioiden innovaatiotoimintaan on saatavilla niukasti. Ongelma koskee mm. tietointensiivisiä organisaatioita.Tämän väitöskirjan tavoitteena on tuottaa uutta tieteellistä tietoa käyttäjien kanssa tapahtuvasta yhteistoiminnallisesta oppimisesta ja saada lisätietoa siitä, miten ja millä käytänteillä tämä oppiminen tukee palveluinnovaatioiden syntyä. Väitöskirjan teoreettinen lähtökohta on teoria ekspansiivisesta eli uutta luovasta oppimisesta. Siinä kuvataan, kuinka organisaatiot voivat oppia uudistamaan toimintaansa syklisesti hahmottamalla ensin toimintansa ristiriitoja ja luomalla sen jälkeen uuden toimintakonseptin, jolla vastataan näihin ristiriitoihin käytännössä. Väitöskirjassa ekspansiivisen oppimisen teoria yhdistetään käyttäjä- ja strategialähtöistä innovaatiotoimintaa kuvaaviin teorioihin. Tavoitteena on vahvistaa sekä alhaalta ylös- että ylhäältä alas -näkökulmia oppimiseen ja innovaatiotoimintaan. Tutkimuksen kontekstina ovat tietointensiiviset palveluorganisaatiot. Konkreettista toimintaa ja käytänteitä kehittää palveluja yhdessä käyttäjien kanssa analysoitiin neljän tapaustutkimuksen avulla julkisen ja yksityisen sektorin organisaatioissa. Työn metodologia on laadullinen, ja tapaustutkimuksissa sovellettiin toimintatutkimuksen lähestymistapaa. Empiirinen aineisto kerättiin havainnointia ja interventioita käyttäen. Tapaustutkimuksiin osallistuneiden avainhenkilöiden teemahaastattelut täydentävät aineistoa; ne keskittyvät sekä innovaatioprosesseihin että niiden tuloksiin. Väitöskirjan keskeinen havainto on, että yhteinen oppiminen käyttäjien kanssa on erottamaton osa tietointensiivisten palveluorganisaatioiden innovaatiotoimintaa; tämä oppiminen tukee sillan rakentamista ylhäältä alas- ja alhaalta ylös -innovaatiotoiminnan välillä, kun sitä toteutetaan ekspansiivisesti ja refleksiivisesti. Edellytyksenä on ymmärrys käyttäjien uudistuvista tarpeista ja arvon luomisesta yhdessä heidän kanssaan. Työn tulokset osoittavat, että "kärkikäyttäjät" ovat tärkeitä yhteistyökumppaneita etsittäessä organisaation strategista suuntaa, ja kaikki käyttäjät ovat kyvykkäitä ideoimaan ja toteuttamaan palveluinnovaatioita käytännössä. Näiden tulosten perusteella väitöskirja täydentää ekspansiivisen oppimisen mallia suhteessa käyttäjiin ja korostaa toimijuuden merkitystä. Ennakointi ja arviointi edistävät tämänsuuntaista kehitystä organisaatioiden strategisella tasolla, ja palveluinnovaatiokokeilut yhdessä käyttäjien kanssa ovat avainkysymys operatiivisella tasolla. Työn päätuloksena esitellään löydöksiin pohjautuva käsitteellinen malli "kaksitasoisena oppimissyklinä". Väitöskirjan teoreettinen kontribuutio on yhteyksien luominen palveluinnovaatiotutkimuksen ja organisaatioiden oppimista käsittelevän tutkimuksen välille. Tätä yhteyttä luodaan sekä mainitulla käsitteellisellä mallilla että kuvaamalla konkreettisia oppimistekoja ja -toimintaa, joiden avulla palveluinnovaatiota voidaan luoda ja niiden tuloksia voidaan kriittisesti reflektoida yhdessä käyttäjien kanssa.
ISBN, ISSN, URN	ISBN 978-951-38-8350-8 (nid.) ISBN 978-951-38-8351-5 (URL: http://www.vtt.fi/julkaisut) ISSN-L 2242-119X ISSN 2242-119X (Painettu) ISSN 2242-1203 (Verkkojulkaisu) http://urn.fi/URN:ISBN:978-951-38-8351-5
Julkaisuaika	Marraskuu 2015
Kieli	Englanti, suomenkielinen tiivistelmä
Sivumäärä	139 s. + liitt. 75 s.
Projektin nimi	
Rahoittajat	
Avainsanat	palveluinnovaatio, organisaation oppiminen, ekspansiivinen oppiminen, yhteistyö, kokeileminen, käyttäjät, tietointensiiviset palvelut
Julkaisija	Teknologian tutkimuskeskus VTT Oy PL 1000, 02044 VTT, puh. 020 722 111

Collaborative learning with users as an enabler of service innovation

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The key finding is that collaborative learning with users is an integral part in innovation activities of knowledge-intensive service organizations, and supports the bridging of the top-down and bottom-up innovation activities if it is pursued in an expansive and reflective manner. This includes understanding the needs of users and the collaborating with them in value creation. More specifically, lead-users can be inspirers and questioners in the search for a strategic direction, and all kinds of users can be collaborators or responsible agents who ideate and implement service innovations in practice. Based on these findings, the thesis supplements the model of expansive learning to include: the strengthening of user-agency at the strategic level by means of evaluation and foresight, and the creation of novel activity at the operational level by experimenting with users in practice. This new conceptual model is presented as a 'two-level learning cycle'.

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