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Driving Growth Through Collaborative Innovation - Case Living Lab

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Abstract

Innovation has become a mandatory for organizations and the most important engine of growth. Companies are trying to anticipate the changing business environment, build competitive products and services that engage customers and outperform competition. However, this has been challenging, and hence there is a need for new approach to organize innovation process that engage external world, including customers. New product development process should also be intensified, and companies should be enriched by external knowledge outside the company. Hence, there is a need for shift in innovation from closed to open innovation. Furthermore, companies should understand that users play a major role in development of products and services. Hence, there is a need for user-centric innovation.

One approach to exploit these three areas is living lab. It is a user-centric, open innovation ecosystem in a real-life environment where users and producers co-create innovations. Living lab emphasizes the idea that user-centric solutions lead to a new form of productivity and competitiveness. Furthermore, it is a method to provide more structure and governance for innovation, and especially open innovation activities.

The research was part of the ongoing innovation agenda of case organization. This innovation agenda has been supported by IBM where the researcher currently works. The research was conducted as a qualitative single case study. The empirical data was gathered from 11 thematic interviews and one workshop. Additionally, selected written materials provided by case organization and IBM were used to provide background information. The empirical data was analyzed by using analytic induction.

The primary research question is: *´How does living lab foster organization´s strategy and innovativeness?´*. Additionally, the paper explores the background of living lab, the purpose of living lab, and its integration to strategy and innovation within the case company. The study aims to provide a view into the living lab approach as a tool to exploit open innovation and user-centric innovation, as well as achieving growth.

As a result of the study living lab is a method to implement strategy and thus achieving strategic objectives. However, living lab can also challenge and reshape the existing strategy through innovation. From innovation perspective, living lab exploits open innovation and user-centric innovation. Hence, living lab enables collaborative innovation and thus improves the innovativeness of the company, as well as growth.

Keywords strategy, innovation, open innovation, user-centric innovation, living lab

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Tiivistelmä

Innovoinnista on tullut organisaatioille pakollista. Lisäksi se on yksi tärkeimmistä kasvunlähteistä. Yritykset yrittävät sopeutua muuttuvaan liiketoimintaympäristöön, luoda kilpailukykyisiä tuotteita ja palveluja, jotka sitouttavat asiakkaat, ja pärjätä kovenevassa kilpailussa. Tämä on kuitenkin ollut haastavaa, joten yrityksillä on tarve organisoida innovaatioprosessi uudella tavalla, joka sitouttaa ja osallistaa ulkoisen maailman, mukaan lukien asiakkaat. Tuotekehitystä pitäisi tehostaa, ja yritykset tulisi rikastuttaa ulkopuolisella tiedolla. Yritysten tulisi siirtyä suljetusta innovoinnista kohti avointa innovaatiota. Lisäksi yritysten tulisi ymmärtää käyttäjien tärkeä rooli tuote- ja palvelukehityksessä. Siksi yritysten pitäisi toimia käyttäjälähtöisemmin innovoinnissa.

Yksi keino hyödyntää näitä kolmea aluetta on living lab. Se on käyttäjälähtöinen, avoimen innovaation ekosysteemi tosielämän ympäristössä, jossa käyttäjät ja suunnittelijat luovat yhdessä innovaatioita. Living lab korostaa ajatusta, että käyttäjälähtöiset innovaatiot johtavat uudenlaiseen tuottavuuteen ja kilpailukykyyn. Lisäksi living lab on metodi, joka tarjoaa strukturoidumman ja paremmin johdetun tavan innovoida, erityisesti avoimeen innovointiin.

Tutkimus oli osa kohdeyrityksen käynnissä olevaa innovaatiohanketta, jota IBM, jossa tutkija työskentelee, on tukenut. Tutkimus toteutettiin kvalitatiivisena tapaustutkimuksena. Empiirinen aineisto kerättiin 11 teemahaastattelun ja yhden työpajan avulla. Lisäksi erilaiset kirjalliset materiaalit kohdeyritykseltä ja IBM:ltä antoivat taustatietoa. Empiirinen aineisto analysoitiin käyttämällä analyyttistä induktiota.

Päätutkimuskysymys oli: ”Miten living lab toimii yrityksen strategian ja innovatiivisuuden kehittämisen apuna?”. Lisäksi tutkimus on tutkinut living labin taustaa, sen tarkoituksia, sekä sen integraatiota strategiaan ja innovointiin kohdeyrityksessä. Tutkimus pyrkii tarjoamaan kuvan living labista työkaluna hyödyntää avointa ja käyttäjäkeskeistä innovointia, sekä kasvun mahdollistajana.

Tutkimustuloksena voidaan todeta, että living lab on metodi, joka implementoi strategiaa ja siten pyrkii toteuttamaan strategiset tavoitteet. Lisäksi living lab haastaa ja uudelleenmuotoilee olemassaolevaa strategiaa innovoinnin avulla. Innovoinnin näkökulmasta living lab hyödyntää avointa ja käyttäjälähtöistä innovointia. Siksi living lab mahdollistaa yhteisöllisen innovoinnin ja siten parantaa yrityksen innovatiivisuutta ja kasvua.

Avainsanat strategia, innovaatio, avoin innovaatio, käyttäjälähtöinen innovaatio, living lab

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The creation of this Master´s thesis has been a tremendous journey. It has had uphill and downhill moments, or even uncommon moments – as some of might know – but in general it has been unforgettable experience which has helped me to exploit and increase my knowledge in my lovely themes: strategy and innovation while pursuing my Master´s degree.

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Helsinki, June 2012.

Timo Rahkonen

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1 INTRODUCTION

Innovation has become part of our culture and as a mandatory for organizations. Well-known economist and innovation researcher Christopher Freeman (1982) pointed out in his famous study of the economics of innovation: *´... not to innovate is to die´*. Innovation has a crucial role for business success (Hoegl et al., 2009). Innovation is the engine of growth. Therefore, innovation discussion has become one of the most important agenda of CEOs and corporate strategy in every industry in today´s world (IBM, 2006, 2010). Executives say innovation is a top priority for driving growth (McKinsey, 2007). Furthermore, innovation is a critical dimension of any dynamic approach to business strategy, because it allows company to achieve and defend competitive advantage (Chesbrough, et al., 2006).

Achieving strategic goals through innovation needs resources, capabilities and competencies (see e.g. Teece, 1997; Venkatraman & Subramaniam, 2002; Prahalad & Hamel, 1990). They are the fuel for innovation. However, many examples in the business life have proved that often growth strategies and capabilities are not sufficient for successful growth and innovation (IBM, 2004). Companies must also be committed to change (see e.g. Mintzberg, 2009). It is a key area to cover when firms want to manage innovation and thus achieve growth (Chesbrough, 2003). Managed change enables to achieve the required capabilities and competencies, but especially to achieve an appropriate innovation culture and organizational structures and roles (Chiaroni, et al, 2010). Furthermore, the shift from traditional closed innovation paradigm to open innovation paradigm means a change in the company (Chiaroni et al., 2010).

The need for innovation is particularly apparent within several services industries, where major challenges, such as increased regulation, generational shifts, empowered customers, weak economic conditions, and increased competition are changing the everyday business of companies. These drive the need for new approach to doing business or even business transformation in order to find new sources of growth,

capture customers attention, build trust and confidence, develop brand, and ultimately meet the customers´ needs better. (see e.g. IBM & Cisco, 2012)

To take advantage of this change, companies must anticipate the changing customer relationship and build competitive products and services that engage customers and outperform competition (see e.g. Porter, 1985; Prahalad & Ramaswamy, 2004; von Hippel, 2005). This needs a new approach to organization´s innovation process.

Open innovation has been proposed a new paradigm for innovation. To intensify the new product and service development process, companies have to admit that `not all the best people are working for us´. Therefore, firms need to be enriched by new external knowledge outside the company. (Chesbrough, 2003) This thesis contributes to this relatively new research field of innovation.

The external knowledge outside the company can have many forms, such as users (customers), suppliers and competitors (von Hippel, 1988). Users play a major role in the development of services. Almost 90 percent of all the important retail services are developed by users (von Hippel & Oliveira, 2009). Therefore, user-centric innovation (von Hippel, 1988, 2005; Reichwald & Piller, 2005) is one of the focus areas of this study.

One approach to exploit open innovation and user-centric innovation is *living lab*, which is also a new research area (Følstad, 2008). However, it is an efficient way to discover what users want and need, and also unexpressed needs (Oliveira, 2010). Furthermore, living lab is a method to engage users in creating, prototyping, validating and testing new services, businesses, markets and technologies in real-life contexts (Gall & Burn, 2008). It aims to provide structure and governance to the user participation (Almirall & Wareham, 2008). Therefore, living lab has a significant role in successful implementation of strategy and innovation initiatives. It offers a new and efficient approach to collaborate with customers in order to drive organization´s growth strategy.

The main focus of this study is on exploring what kind of phenomenon living lab is, and how does it contribute to case company´s strategy and innovation agenda – the program and overall direction of innovation activities. However, neither the case firm of this study nor the industry where it operates can be revealed.

The case company and the research topic were chosen partly because the researcher works as a strategy consultant at IBM Global Business Services which has assisted the case company to form an innovation strategy. The researcher was a key member of that project which, for example identified several innovation programs for the case company to implement the innovation strategy. One of the innovation programs is `Living Lab´, which is the research area of this study. Hence, this thesis continues the previous work of IBM and the case company in the field of innovation agenda of case company by focusing on Living Lab.

Furthermore, the case company also presents a service industry. Whereas the prior open innovation research has mainly focused on high technology industries (Chesbrough, 2003), this study contributes to the research field of open innovation by bringing in more research from the service industry. In addition, living labs for user-driven open innovation has been identified as an important area for future research by several authors that have explored research on innovation and living lab (Almirall & Wareham, 2008; Katzy & Klein, 2008; Følstad, 2008). In addition, there is a need to study why and how companies are using living labs (Almirall & Wareham, 2008). This thesis is set to investigate this matter further. The focus is on the tension and relationship between innovation and strategy. As Chesbrough and Appleyard (2007) states: *´it is timely to juxtapose some new phenomena in innovation with the traditional academic view of business strategy´*.

In addition to contributing to the research field of strategy and innovation, another purpose of the study was to produce managerial recommendations relating to the living lab concept of open innovation and user-centric innovation. For example, the interaction between case company´s strategy and living lab, as well as the interaction between case

company´s product development process (innovation process) and living lab are presented. These recommendations are based on the empirical study as well as the earlier literature around the subject.

1.1 Research Problem and Research Questions

The primary purpose of this study is to answer the following research question:

Research question: How does living lab foster organization´s strategy and innovativeness?

To discern more detailed relationships within the above-stated research question, three sub-questions were posed:

Sub-question 1: What is the background of Living Lab?

Sub-question 2: For what purposes Living Lab can be used?

Sub-question 3: How does Living Lab integrate with case company´s corporate strategy and innovation?

Additional objectives of the study are to take a broader view into existing living labs and evaluate the key elements of them in comparison to case company´s approach. Furthermore, the study aims to provide a view into the living lab approach as a tool to exploit open innovation and user-centric innovation, as well as achieving growth.

1.2 Research Scope and Limitations

The scope of this research is confined by four elements: the chosen open innovation and user-centric innovation approach – living lab, the context of case company´s strategy and innovation, the current situation of living lab, and the characteristics of the selected case company. Hence, Living Lab was chosen to a scope not only because of case company´s request, but also because it is a new and prominent research area of open

innovation and user-centric innovation in practice (Almirall & Wareham, 2008). Typically companies are struggling with their transformation of closed to open innovation, but living lab provides a concrete method to drive open innovativeness and user involvement (Almirall & Wareham, 2008).

Secondly, while living lab can be analyzed in various contexts, the scope of this study is restricted to the context of case company´s innovation agenda. Living lab is part of the company´s broader agenda in terms of innovation and strategy, and this study aims to understand this relation. Hence, strategy and innovation provide an appropriate way to understand the empirical phenomenon. Therefore, context such as detailed process view and detailed managerial view of how to operate living lab are excluded. Furthermore, this study uses a traditional approach of strategy, instead of current evolving alternative perspective for strategy and management: strategy as practice, which sees strategy as something that people do (Jarzabkowski, 2004, 2005; Whittington, 2006). There are two reasons for that choice. First, case company´s strategy view is traditional. Second, there is a need to study new phenomena in innovation with the traditional view of business strategy (Chesbrough & Appleyard, 2007). This study contributes to that need.

Thirdly, this study contributes only on the understanding and development phase of Living Lab. In other words, what happens before the launch of Living Lab. Hence, this study excludes the empirical study of Living Lab after the launch. The reason for that is because the launch is scheduled after this study later in 2012. However, this is an interesting future research area, as will be stated in the last section of the study: Recommendations for the Future Research.

Fourthly, the characteristics of the selected case company confine the scope of the study. As a result, only the information gathered from the case company will be used as primary sources of input on assessing the research questions. Hence, possible benchmarking study findings from other studies will not be considered as primary sources of information. However, the expert interview acts as an important source in providing managerial recommendations.

This study recognizes various limitations that may have an impact on the findings. First, the study was accomplished in one of the service industries, and therefore cannot be generalized directly to other industry fields. Second, personal biases, values and assumptions may have distorted the results. Third, the interviewees of case company present mainly managerial level which may limit the findings because of lack of understanding in the customer and grass roots levels. However, this issue was tackled through arranging a workshop which includes also employees who work in the customer interface.

1.3 Definitions

This part of the Introduction section presents the key concepts of the study.

Strategy

Strategy is a guiding principle for organization. It brings together – a synthesis – of actions and intentions that shape a company and influence its performance. (Mintzberg et al., 2009).

Innovation

Innovation is about coming up with and implementing something new. It is about searching for ideas, developing and implementing them, and successfully introducing them (as products or services) into the marketplace. What differentiates innovation from inventions is the successful commercialization. (Buijs, 2007)

Innovativeness

The propensity for a firm to innovate or develop new products (Ettlie, Bridges & O'Keefe 1984)

Open innovation

Open innovation was coined by Henry Chesbrough (2003) who suggests that it is a new paradigm for innovation, replacing the old paradigm called closed innovation, which focuses on internal innovation activities (R&D) within companies, excluding the external environment. Open innovation paradigm suggests that companies can and should use external as well as internal ideas and paths to market in order to achieve long-term success in today´s fast-moving market environment (Chesbrough, 2003).

Users and Customers

Users are *´firms or individual consumers that expect to benefit from using a product or a service* (von Hippel, 2005). In this study users means customers.

User-centric innovation

The importance of users in the innovation process has been increasing in recent years (von Hippel, 1988, 2005). User-centric innovation means that customers involve directly in the development and deployment of new products and services (von Hippel, 2005).

Living lab

Living lab is user-centric, open innovation ecosystem in a real-life environment where users and producers co-create innovations (Orava, 2009; Oliveira, 2010). Living lab emphasizes the idea that user-centric solutions lead to new form of productivity and competitiveness (Oliveira, 2010).

1.4 Methodology

This study was conducted as a qualitative single case study. According to Koskinen et. al. (2005), qualitative method is a valid method when the research attempts to answer questions, such as ´how´ and ´why´. Eriksson & Kovalainen (2008) emphasize also that when in-depth information and understanding are needed, case study is a proper way to conduct a research. In addition, according to Yin (2009) the case study method

investigates a contemporary phenomenon in depth and in the real-life context where the boundaries between the phenomenon and context are not clearly visible.

The empirical data was gathered from 11 thematic interviews and one workshop held at case company. One of the interviewees present an expert point of view of living lab, and the rest were employees of the case company. In addition to these interviews, the previous material conducted through IBM´s Innovation Strategy project for case company, as well as the previous relevant material conducted of case company were used in this study to understand and draw a broader picture of Living Lab.

The research findings are based on the insights from the interviews, workshop, and other provided material, backed up by related existing literature of strategy, innovation and living lab. The empirical data was analyzed through analytic induction. A more detailed description of methodology used in this study will be provided in the Methodology chapter of this thesis.

1.5 Structure of the Thesis

This study is structured into six chapters. Chapter 1 provides an introduction and overview on the objectives of the study and key research questions.

Chapter 2 introduces strategy and innovation literature to provide context for understanding the phenomenon examined in this study. The selected points from previous research on strategy and innovation are presented. Research streams of growth strategy, resource-based view theory, and change form the basis of strategy literature. Whereas, innovation process through new product development, open innovation and user-centric innovation constitute the basis of innovation literature.

Chapter 3 presents an overview of living lab concept and benchmarking study of some existing living labs. However, most of these examples are excluded on this version of the study.

Chapter 4 is devoted to a more profound account of the research methodology that was shortly described earlier in this Introduction chapter. More detailed comments relating to the validity and reliability of the research are also included.

The empirical results of the case study will be presented in Chapter 5 which is devoted to case company´s Living Lab. The chapter introduces also the case company´s strategy and innovation agenda. However, this chapter is excluded on this version of the study.

The final chapter presents the conclusions of the research based on the empirical study and the related previous literature. Furthermore, managerial recommendations for the case company will be provided in the end of the study, as well as ideas on future research. Figure 1 presented below visualizes the content and defined objectives of each chapters of the study.

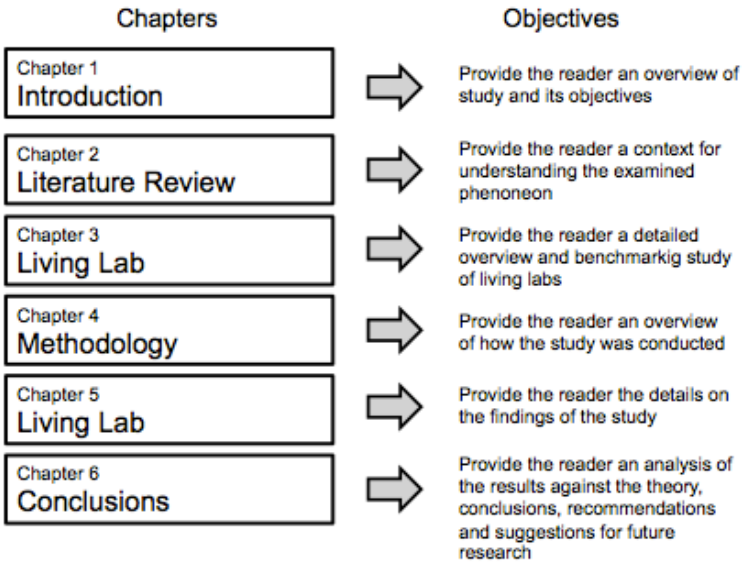

Figure 1: Structure of the Study

2 LITERATURE REVIEW

The objective of the literature review is to introduce key concepts and thoughts that support the reader in framing the living lab approach within the broader context of strategy and innovation. The literature review is structured into three sections. The first section includes the positioning of the research topic within the broader area of strategy and management literature, and especially in context of growth strategy; resources, capabilities and competencies; and change. The second section is devoted to innovation, its key concepts and a brief overview of currently prominent approaches, such as open innovation and user-centric innovation. The relationship between strategy and innovation literature will be introduced in the third section, as well as the summary of the literature review. Living lab approach with examples of existing living labs is described in detail in Chapter 3.

2.1 Strategy and Management Literature

This section on strategy and management literature provides a brief overview of how the study area has evolved and how this area of literature provides a link to the business growth initiative that the case company has been addressing with the living lab approach. The overview is based on prominent in-depth analysis articles on the strategy and management literature, including topics of growth strategy; resources, capabilities and competencies; and managed change.

2.1.1 Introduction and Patterns in Literature

The roots of the strategic management field can be traced to historical writings of military strategy by Sun Tzu (1971) and Carl von Clausewitz (1968). However, the modern literature is commonly referred to be triggered from the rise in business school curricula and business practice in the USA in the 1960s lead by the powerful general management teaching group at the Harvard Business School. The field started to evolve through the impact of publications, such as Alfred D. Chandler´s *Strategy and Structure*

(1962), Igor Ansoff´s *Corporate Strategy* (1965) and Kenneth R. Andrews´ *The Concept of Corporate Strategy* (1971).

Examining patterns within strategic management literature, it is possible to identify different perspectives. Bowman et al. (2002) describe the evolution of critical ideas and literature in strategic management as being characterized by several shifts in the emphases of strategic management research. In the mid-1960s the focus was the *firm* with its strengths and weaknesses as key elements. In 1970s and early 1980s, the focus area was the *environment* and its relationship to the firm, including industry analysis. Later in the 1980s the focus area switched to the strategy performance relationship, when *industries, markets and firm scope* were all in the focus. Throughout the 1990s, *firm capabilities and core competences* (Prahalad & Hamel, 1990) became the primary focus area, leading the emphasis later on *knowledge* with links to building of capabilities and competitive advantage (Spender & Grant, 1996; Nonaka, 1994). (Bowman et al., 2002)

While this simplistic view is widely recognized, strategic management research has been characterized by multiple influences from various sub-fields of economics research. Examples of these include industrial economics on the study of positioning in industries, economics and sociology of organization on the study of firm resources and capabilities, and game theory on the study of competitive interactions.

This industrial organization economics (IO economics) formed the basis for analyzing the problems of the firm, but especially the industries in which they existed. Researchers tried to examine, whether industry structural characteristics constrain the strategies of competing firms. Issues of industry concentration, barriers to entry, cost and price structures, economies of scale and scope, investment choices, vertical integration, profitability rates and growth patterns were explored. This was the most exemplified by Michael E. Porter (1980) whose thoughts on competitive actors in the firm´s industrial, competitive environment – the five forces – became one of the leading thoughts in that era. The five forces for strategic consideration and analysis were

suppliers, competitors, possible substitutes, potential entrants, and customers (Porter, 1980). (Bowman et al., 2002)

In the area of capabilities and resources, the early work in strategic management focused on firm´s strategy and choices of the firm. In the mid-1980s, Birger Wernerfelt (1984) introduced the resource-based view (RBV) of the firm: analysis of the firms from the resource side rather than from the product side. The key was to explore which firm´s resources could be used to generate value. Later Jay Barney (1991) provided more process oriented thinking to this approach by analyzing, which resources could generate sustained competitive advantage. More recently, the area of knowledge management has evolved to analyze, which knowledge could be strategic assets (e.g. Winter, 1987). (Bowman et al., 2002)

Game theory relates to *competitive interactions* (see e.g. Camerer, 1991; Saloner, 1991; Nalebuff & Brandenburger, 1997). The questions, such as what the company should do and what its rivals´ actions are likely to be, are the elements of interest. This also refers to the area of *competitive dynamics* (e.g. Ferrier, Smith & Grimm, 1999; Grimm, Lee & Smith, 2006) which is the analysis of competition at the action and response level to predict how a firm will act or react against rivals.

Furthermore, Mintzbergs process view of strategy (1978, 1990, 1994) and the field of strategy process research (Pettigrew 1992; Chakravarthy & Doz, 1992) are areas of research that illustrate key patterns of the strategic management literature. Strategy process research has provided useful descriptions of structures and administrative systems that lead to improved organizational performance (Chakravarthy & Doz, 1992).

Venkatraman and Subramaniam (2002) provide interesting complimentary view into the patterns in the theory and research of strategic management. They have examined how the current understanding of strategy has evolved over time. According to them, the evolution of strategy research has three eras: first, where strategy was views as a *portfolio of business* (1970s), second as a *portfolio of capabilities* (mid-1980s), and third, as a *portfolio of relationships* (mid-1990s). Each of these eras represents how

organizations have emphasized a particular concept of strategy with an associated set of norms for creating competitive advantage. The Table 1 below summarizes these thoughts of different eras in strategic thinking. (Venkatraman & Subramaniam, 2002)

	Era 1 (1970s)	**Era 2 (mid-1980s)**	**Era 3 (mid-1990s)**
Description	Portfolio of businesses	Portfolio of capabilities	Portfolio of relationships
Key drivers of competitive advantage	Economies of scale	Economies of scale and scope	Economies of scale, scope and expertise
Key resources	Physical assets	Organizing skills for managing relatedness across businesses	Position in the network of expertise
Unit of analysis	Business unit	Corporation	Network of internal and external relationships
Key concept	Leverage industry imperfections	Leverage intangible resources	Leverage intellectual capital
Key questions	What products? What markets?	What capabilities?	What streams of expertise?
Dominant view	Positioning	Inimitability of processes and routines	Network centrality
Representative studies	Andrews (1971), Ansoff (1965), Porter (1980)	Barney (1991), Prahalad & Hamel (1990)	Quinn (1992), Lewis (1994), Nonaka (1994), Kogut (2000) Venkatraman & Subramaniam (2002)

Table 1: The Evolution of Strategy from a Theorizing Perspective (Venkatraman & Subramaniam, 2002, p. 473)

Another interesting analysis of different thoughts in strategic management is ten major schools of strategic management by Henry Mintzberg, Bruce Ahlstrand and Joseph Lampel (2009). Their book *`Strategy Safari – The complete guide through the wilds of strategic management´* presents ten distinctive points of view which are the most reflected in management practice. These schools of thought on strategy formation are illustrated in the Table 2 below:

Strategy School	Description	Key Message	
The Design School	Strategy formation as a process of *conception*	Fit	Prescriptive
The Planning School	Strategy formation as a *formal* process	Formalize	
The Positioning School	Strategy formation as an *analytical* process	Analyze	
The Entrepreneurial School	Strategy formation as a *visionary* process	Envision	Descriptive
The Cognitive School	Strategy formation as a *mental* process	Cope or create	
The Learning School	Strategy formation as an *emergent* process	Learn	
The Power School	Strategy formation as a process of *negotiation*	Promote	
The Cultural School	Strategy formation as a *collective* process	Coalesce	
The Environmental School	Strategy formation as a *reactive* process	React	Combination
The Configuration School	Strategy formation as a process of *transformation*	Integrate, transform	

Table 2: Ten Schools of Strategic Thought (Mintzberg et al., 2009)

Post 1990s have been described as a time of integration and cross-fertilization of thinking in which the literature has begun to focus on strategic themes and complementary scholarly development (Pettigrew et al., 2002). Some popular strategic themes in the 2000s have been *blue ocean strategy* (Kim & Mauborgne, 2004), *strategic agility* (Doz & Kosonen, 2008) and *strategic foresight* (Marcus, 2009).

In summary, strategy today is an extraordinarily demanding, complex and subtle discipline as the above examples of perspectives on the patterns of strategy and management denote. Scholars, business book writers, consultants and other business professionals bring new ideas of expertise to strategy constantly. However, strategy should be seen as synthesis and for example, Mintzberg et al´s (2009) 10 schools of strategic thought as complementary instead of competing. Mintzberg et al (2009) argue that: *´Every strategy process has to combine various aspects of the different schools.´* Therefore, strategy as its essence, is integrative. It brings together – a synthesis – of actions and intentions that shape a company and influence its performance (Mintzberg et al., 2009) But, as the different research and theory patterns of strategy presented

above show, the strategy field has become more and more fragmented. Mintzberg et al. (2009) call strategy as *strategy beast*.

However, some general areas of agreement on strategy exist. According to Mintzberg et al. (2009) these are:

- Strategy concerns both organization and environment
- The substance of strategy is complex
- Strategy affects overall welfare of the organization
- Strategy involves issues of both content and process
- Strategies are not purely deliberate
- Strategies exist on different levels
- Strategy involves various thought processes

2.1.2 Strategy and Change

Strategy has a close role with change. Strategies are planned and executed, for example because organizations are not satisfied with the current status. They want to achieve their goals, such as revenue growth and market share increasing through strategy work. In addition, strategies assist to achieve something stable and consistent, for example innovativeness. Therefore, it is vital to understand the concept of change in strategy practice. It is an important area to cover when organizations want to manage innovation and drive change from strategy to execution (Chesbrough, 2003). The following chapters entail this important area by covering key elements of strategy and change which are relevant for this study. First, growth via strategy is covered. Secondly, growth is seen possible through different resources, capabilities and competencies. Finally, the required growth strategy and capabilities usually need change in the company.

Growth Strategy

Strategy is the guiding principle for the organization. Typically every organization wants to achieve *growth* and therefore growth is an important factor of strategy. There are several ways to achieve this ambitious goal and the following chapters will present some strategies to address this important issue.

One of the most famous frameworks to analyze growth is Igor Ansoff´s growth matrix which was published in Harvard Business Review already in 1957. His product-market expansion grid provides a useful though not exhaustive framework for looking at possible growth strategies. In addition, it helps to cope with the problem of *strategic windows* (Abell, 1978) and finding ways of creating overlapping windows. Strategic windows represent different strategic opportunities in which it is possible for the organization to increase sales both in volume and cash. An organization can have several strategic windows open at a time and these may be related to different types of growth strategy that the organization can pursue. (Abell, 1978)

Ansoff´s matrix involves two dimensions: product and market. Furthermore, there are four major growth options: market penetration, market development, product development, and diversification. In each of these situations there are strategic choices presented on which to take action. Market penetration strategy includes, for example increasing purchase use by existing customers, winning customers from competition and converting non-users. Market development strategy includes choices, such as new market segments, new distribution channels and new geographic markets. Product development strategy includes new features, different quality levels and new products. Finally, diversification strategy may include following strategic choices: diversification through organic growth, acquisition and/or joint venture. Matrix´s purpose is to allocate resources to where the best growth possibilities exist. Ansoff´s growth matrix is presented below in the Figure 2. (Ansoff, 1957)

Figure 2: Ansoff ´s Growth Matrix (1957)

The above matrix will be used in this study later to present how the case company is achieving innovative growth through living lab.

Resources, Capabilities and Competencies

Whichever growth strategy an organization chooses, it is vital to line up the operational model with the resources, capabilities and competencies that enable it. Especially capabilities are the sustaining foundation of a strategy. This part of the study presents some key thoughts from this area. First, popular resource-based view (RBV) theory is presented to cover resources and capabilities, and especially dynamic capabilities. Then the focus switches to competence-based research.

Firm´s resources can be defined to include all assets, capabilities, organizational processes, firm attributes, information and knowledge controlled by the firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness (Daft, 1983).

As stated earlier, RBV theory was introduced in 1984 by Birger Wernerfelt who was the first in strategy to develop further the seminal work of Penrose (1959). RBV is based on gaining competitive advantage (see e.g. Porter, 1985) by using firm´s resources effectively and combining different capabilities appropriately (Barney, 1991; Teece et al., 1997). Therefore, resources are seen as a source of competitive advantage. Barney (1991) defines competitive advantage as firm having value-creating strategy which is not used by any competitors of firm at that moment.

Widely accepted argument is that elements for competitive advantage and value creating strategy lies in firm´s heterogeneous resources (Wernerfelt, 1984; Barney, 1991; Teece et al., 1997). Barney (1991) argues further that firm´s resources can provide sustained competitive advantage enforcing two assumptions: firms within an industry may be heterogeneous with respect to the strategic resources they control and secondly, resources may not be perfectly mobile across firms.

The RBV literature has evolved from Wernerfelt´s (1984) and Barney´s (1991) articles towards dynamic capabilities (Teece et al., 1997; Eisenhardt & Martin, 2000). Teece et al. (1997) have developed a dynamic capabilities framework. They argue that firms need *dynamic capabilities* approach in order to effectively exploit existing internal and external firm-specific competences to address changing competitive environment. They define dynamic capabilities as *´the firm´s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.´* Hence, dynamic capabilities reflect a firm´s ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions. Dynamic capabilities have close relation with the term *capabilities* which emphasizes the key role of strategic management in appropriately adapting, integrating and reconfiguring internal and external organizational skills, resources and functional competences to match the requirements of a changing environment. (Teece et al., 1997)

The difference between RBV theory and dynamic capabilities according to Mintzberg et al. (2009) is that, while RBV theory emphasizes the rooting of these capacities in the evolution of the organization, the dynamic capabilities approach emphasizes their development through a process of strategic learning. In a dynamic environment sustaining competitive advantage emphasizes the combining, arranging and rearranging resources. Doing this effectively depends on learning. (Mintzberg, et al., 2009)

Venkatraman and Subramaniam (2002) presented earlier the three eras of strategy evolution. The third era, the portfolio of relationships, offers an interesting insight for resources and capabilities discussion, as well as to current hot topic of innovation research, open innovation, which will be covered in the Innovation section.

In the 1990s and 2000s one focus area has been the research of how a corporation acquires capabilities through relationships. These capabilities act as core drivers for value delivering to customers. The key premise in this discussion is that in the knowledge economy, no one firm can have all the required capabilities inside the corporate boundaries. Knowledge resources cannot be appropriated like physical,

tangible resources. Cross-licensing, co-sourcing, joint R&D and joint venturing are examples for leveraging knowledge resources. (Venkatraman & Subramaniam, 2002)

Venkatraman and Subramaniam (2002) argue that a new view to look at strategy is needed: *economies of expertise*. They are advantages that come from leveraging knowledge flows in a complex network of relationships (e.g. partners, suppliers, and customers). Kogut (2000) points out that the strategic focus shifts from strengthening internal processes and routines for leveraging internal capabilities to building mechanisms that enable identifying, sharing, and absorbing knowledge in a broader network of organizations.

Competence-based research (e.g. Itami, 1987; Prahalad & Hamel, 1990) in strategy has close relation with competitive advantage, RBV theory and dynamic capabilities. Prahalad and Hamel (1990) argue that the ´roots´ of competitive advantage can be found in the *core competencies* of a firm. They used an image of a ´competence tree´ to illustrate their thoughts. They refers corporation like a tree that grows from its roots. Core products are nourished by competencies and engender business units, whose fruit are end products. Hence, Prahalad and Hamel (1990) argue that competitive advantage derives from deeply rooted abilities which lie behind the products that a firm produces. Abilities allow the firm to diversify into new markets by reapplying and reconfiguring what it does best. Furthermore, authors argue that because these competences are hidden like the root of a tree, they cannot easily be imitated. Therefore, the secret of success lies not with great products but with a unique set of abilities that allow a firm to create great products. Managers are thus encouraged to look at their business as a portfolio of resources and capabilities which can be combined in various ways, not as a collection of products or business divisions. (Prahalad & Hamel, 1990)

Prahalad and Hamel (1990) identified core competencies as: *´collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies.´* Furthermore, these competencies are *´communication, involvement, and a deep commitment to working across organizational*

boundaries´. They involve many levels of people from all business functions. Therefore, they are ´the glue´ that binds existing business. Competencies are also the engine for new business development. (Prahalad & Hamel, 1990)

Managed Change

Organizations will need to adapt to changing market conditions and at the same time cope with the need for a renewing. Organizations change because they want to increase productivity, enhance competitiveness and contain costs. Organizations are never completely static because they are in continuous interaction with external forces, such as customers, competitors and suppliers.

But what is change, what to change and how to manage it? For those questions, Mintzberg´s (2009) *change cube* (see Figure 3) is a practical tool. It shows two major dimensions of change: strategy and organization. Mintzberg (2009) argues that change can be about *strategy*, the direction an organization is heading (on the left side of the cube), and about *organization*, the state it is in (the right side). Both of these have to be considered when dealing with change in organization. (Mintzberg, 2009)

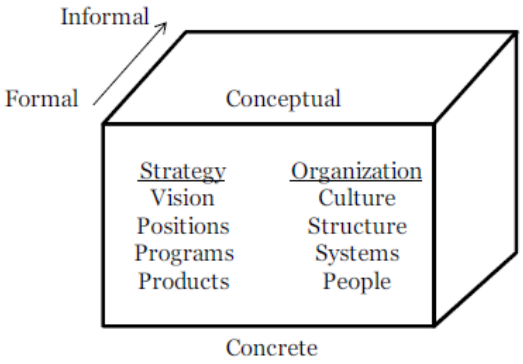

Figure 3: The Change Cube (Mintzberg, 2009)

In addition, Mintzberg (2009) argues that both strategy and organization can range from *conceptual* (abstract) to rather *concrete* (tangible). When looking up and down the cube, on the strategy dimension the most conceptual is vision (strategic perspective) which can be change by rethinking. From the organization side, the most conceptual is culture.

Its change process involves reenergizing and revitalizing. Then moving towards more concrete elements, changes in strategic positions and organizational structure provide the next areas of change. Position can be changed by repositioning and/or reconfiguring, whereas change in structure means reorganizing and/or reducing. Finally, programs and products from the strategy side, as well as systems and people from organization side provide the most concrete elements of change. Programs and systems include reprogramming, reworking and reengineering. While products and people include managerial activities, such as redesigning, retraining and replacing. (Mintzberg, 2009)

While changes on the most concrete level are quite easily done, Mintzberg (2009) argues that: *´Wherever you intervene on this cube, you have to change everything below´*. Therefore, if you are to change a structure, you should also consider changing systems and people, or to change a vision, you should also rethink strategic position as well as redesigning programs and products. Especially this latter finding is important for this research as the following chapters will present. (Mintzberg, 2009)

Furthermore, the third and final dimension of the change cube provides the notion of a formal vs. informal approach given the example that a strategic position can be more formal (deliberate) or more informal (emergent), while people can be changed formally through education or informally through coaching and mentoring.

Another interesting complimentary view into the change is to analyze the main types of change which exist. David Wilson (1992) has examined this area by identifying different levels at which the change may occur: the strategic or the operational. The Table 3 below illustrates three dimensions of change: degree of change, level of change and its characteristics. The degree of change can vary from status quo and incremental change to revolutionary transformation. Interesting finding from the figure is that even though the strategy may stay the same, the change in organizational level is critical. In other words, a new strategy may be adopted, but it is based on the same existing parameters of the organizations, such as commercial principles and organizational capabilities.

	Degree of Change	Description	Characteristics
1.	Status quo	Can be both operational and strategic	No change in current practice
2.	Expanded reproduction	Mainly operational	Change involves producing more of the same (goods or services)
3.	Evolutionary transition	Mainly strategic	Change occurs within existing parameters of the organization
4.	Revolutionary transformation	Predominantly strategic	Change involves shifting or redefining existing parameters

Table 3: Dimensions of Organizational Change (Wilson, 1992, 20)

However, managing change is difficult. The most fundamental problem is changing the behavior of people. Kotter and Cohen (2002) argue that: *´The central challenge is not strategy, not systems, not culture. These elements and many others can be very important, but the core problem without question is behavior - what people do, and the need for significant shifts in what people do.´* Other typical challenges in change management are crisis management, implementation challenges and resistance. A crisis is conventionally defined as a life-threatening event for an organization. Operationalizing or implementing strategic plans, including change plans, might be a tricky issue. Implementation is sometimes uncontrollable, since its fragmented and contradictory nature. Implementation can be very challenging especially when the resistance is strong. Individuals can become fearful of either losing their current status, expertise, and possible influence as a result of a new direction in organization policy. In addition the organizational elements have influence, including culture, structure, lack of resources and contractual agreements. (Whipp, 2003)

As these examples of managed change illustrate, change can have various dimensions and degrees. Hence, change seems as a complex and challenging issue. However, it is a manageable issue in the organizations. It is important to understand the right dimensions and degree of it to successfully execute the change agenda. One interesting dimension is

to analyze the concept of change from the innovation perspective, but this will be covered in the Innovation section.

However, dealing with issues such as growth strategy, capabilities and change is not simple in today´s business environment. If a company truly wants to achieve and defend competitive advantage, it requires a new dimension to business strategy: innovation (Chesbrough, 2003). Innovation is a factor that both formulates and implements the strategy. Innovation and strategy have closed relationship and they can be said to be in constant interaction and in tension. They are complementary and powerful when they co-exist and are effectively leveraged (Dobni, 2010). With right resources, capabilities and competencies an organization is able to foster its innovativeness, thus competitive advantage. Typically this requires change in the organization´s strategy and culture, as well as development of new capabilities. The current trend is switching from closed innovation paradigm to open innovation paradigm, and focusing on customer-centric activities. These areas will be covered in the next section: innovation.

2.2 Innovation Literature

This section on innovation management literature provides a brief overview of how the study area has evolved and how this area of literature provides a link to understand case company´s growth initiative, and especially the innovation agenda and the living lab approach that the company is driving for. The overview is based on prominent in-depth analysis articles on the innovation management literature, including topics of new product development, open innovation, and user-centric innovation.

2.2.1 Introduction and Patterns in Literature

Innovation is not a new phenomenon. There have been innovations since the birth of a mankind. Innovation is something that is part of a human nature: constantly seeking new and better ways of doing things, and then trying them in practice. The roots of the innovation management field are also broad. They can be found at least in economics

(e.g. Schumpeter, 1934; Penrose, 1959), administrative science (e.g. Selznick, 1957; Snow & Hrebniak, 1980) and strategy (Chandler, 1962; Ansoff, 1965; Andrews, 1971).

Innovation studies started to emerge as a separate field of research in the 1960s according to Fagerberg (2005). An important event was the formation of Science Policy Research Unit (SPRU) at the University of Sussex, UK in 1965. The name of that center illustrates the tendency of that time. Term ´innovation´ was replaced with ´science studies´. However, later research has shown that science is only one of the many ingredients of innovation. This finding has evolved the innovation science towards a cross-disciplinary orientation, the need for innovation to be studied from different perspectives. No single discipline deals with all aspects of innovation. Hence, it is necessary to combine insights from several disciplines to get a comprehensive overview. (Fagerberg, 2005) This is one reason why this study also uses the strategy and management literature to understand the empirical phenomenon of this study in a broader view.

But what disciplines have played a major role in the development of innovation study? Traditionally, economics has dealt primarily with the allocation of resources to innovation and its economic effects. In contrast, the innovation process has been treated as a ´black box´ as Fagerberg (2005) calls it. Other disciplines have dealt with that area, such as organizational science. Cognitive science, sociology, organizational science, management and business studies have played role for example in learning, an important area of innovation. Other scholars that have had role are, such as entrepreneurship, design, technology and engineering. (Fagerberg, 2005)

Paul Trott (2005) presents that traditional arguments about innovation have centered around two schools of thought. First, the social deterministic school argued that innovations were result of a combination of external social factors and influences, such as demographic changes, economic influences and cultural changes. This school argued that *when* the conditions were ´right´ innovations would occur. On the other hand, the

individualistic school argued that innovations were the result of unique individual talents and such innovators are born.

In recent decades the innovation literature has focused on what ´drives´ innovation. This point of view has two schools: the market-based view and the resource-based view. The market-based view argues that market conditions provide the context to facilitate or constrain the extent of firm innovation activity (e.g. Porter, 1980, 1985; Slater & Narver, 1994). The key issue here is the ability of a firm to recognize opportunities in the market place. However, only a few firms have ability to do so (Cohen & Levinthal, 1990). (Trott, 2005)

The resource-based view of innovation has roots in the RBV discussion presented earlier (e.g. Penrose, 1959; Wernerfelt, 1984; Prahalad & Hamel, 1990; Teece et al., 1997). It considers that a market-driven orientation does not provide an appropriate foundation for formulating innovation strategies for markets which are dynamic and volatile. A firm´s own resources provide a much more stable context to develop its innovation activity and shape its markets in accordance to its own view. The resource-based view of innovation focuses on the firm and its resources, capabilities and competencies. It argues that when firms have resources that are valuable, rare and not easily copied they can achieve a sustainable competitive advantage – frequently in the form of innovative new products. (Trott, 2005)

An interesting way to analyze the different thoughts in innovation management is to use an approach of models of innovation which was presented by Roy Rothwell (1985, 1992, 1994) and later developed by Paul Trott (2005). The approach presents five different innovation models from the 1950s to present. The five generations of innovation management is a descriptive model of how companies structure their innovation processes over time (Rothwell, 1994).

Innovation process has traditionally been viewed as a sequence of separable stages or activities. There are two basic variations of this linear model for product innovation. First, there is a technology-driven model, often referred to as *technology push* (see e.g.

Mowery & Rosenberg, 1979; Freeman, 1982). It assumes that scientists make unexpected discoveries, then technologists apply them to develop ideas, and finally engineers and designers turn them into prototypes for testing. These activities take action in organization´s R&D department. Then, manufacturing devise ways of producing the products efficiently. Finally, marketing and sales promote the product to the potential customers. In this technology-driven model, the marketplace is a passive recipient for the fruits of organization´s R&D. Furthermore, this model assumed that *´more R&D in´* resulted in *´more successful new products out´*. This model dominated the industrial policy in the 1950s and 1960s. The origins of this idea can be sourced back to Schumpeter (1934) who argued that the leading engine of growth is the technology and new products, whether generated outside the economic system or in the large R&D laboratories. (Rothwell, 1992, 1994)

However, new studies in the 1960s and 1970s (e.g. Schmookler, 1966, 1972; Meyers & Marquis, 1969; Utterback, 1974; von Hippel, 1978) suggested that the role of the marketplace has more influence in the innovation process. This lead to the second linear model of product innovation: a *market pull* or demand pull model of innovation. It is a customer need-driven model which emphasizes the role of marketing as an initiator of new ideas, resulting from close interactions with customers. These ideas are then conveyed to R&D for design and engineering. Finally, manufacturing produces the products. This and another linear model, technology push, are illustrated in the Figure 4 below. (Rothwell, 1992, 1994)

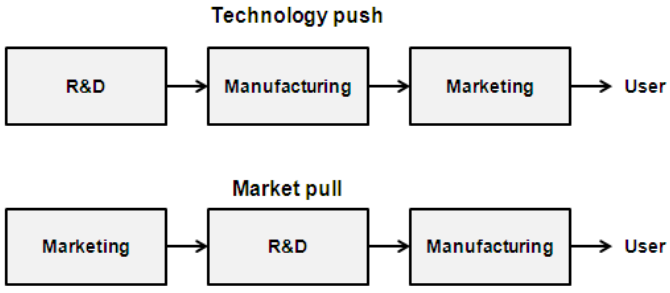

Figure 4: Linear Models of Innovation (Adapted from Rothwell, 1994 and Trott, 2005)

However, both technology push and market pull models have their limitations. Galbraith (1982) pointed out that the models above focus on what is driving the downstream efforts rather than on *how* innovations occur. The linear model answers only to the question, where the initial stimulus for innovation was born. In other words, where the trigger for the idea was initiated. *A simultaneous coupling model* shown in the Figure 5 below suggests that all three functions, R&D, marketing and manufacturing, foster innovation as a result of the simultaneous coupling of knowledge. (Trott, 2005)

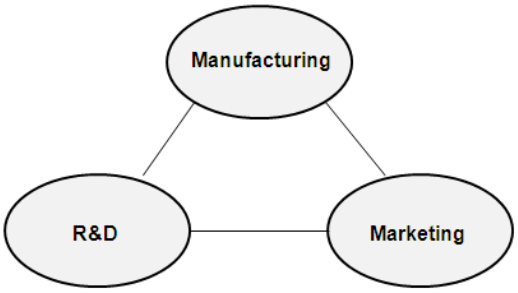

Figure 5: Simultaneous Model of Innovation (Trott, 2005)

The fourth model of innovation is *an interactive model*. It links together the technology push and market pull models. It emphasizes that innovations occur as the result of the interaction of R&D, marketplace and organization´s capabilities. It also suggests that there is no explicit starting point for innovation, like in the coupling model. The interactive model is a more comprehensive representation of the innovation process. Rothwell and Zegveld (1985) point out that it can be regarded as a logically sequential, though not necessarily continuous, process that can be divided into a series of functionally distinct but interacting and interdependent stages. Furthermore, Trott (2005) describes that the innovation process, presented in the Figure 6 below, presents the organization´s capabilities and its linkages with both the marketplace and the R&D base. Organizations which are able to manage this process effectively will be successful at innovation. (Rothwell, 1994)

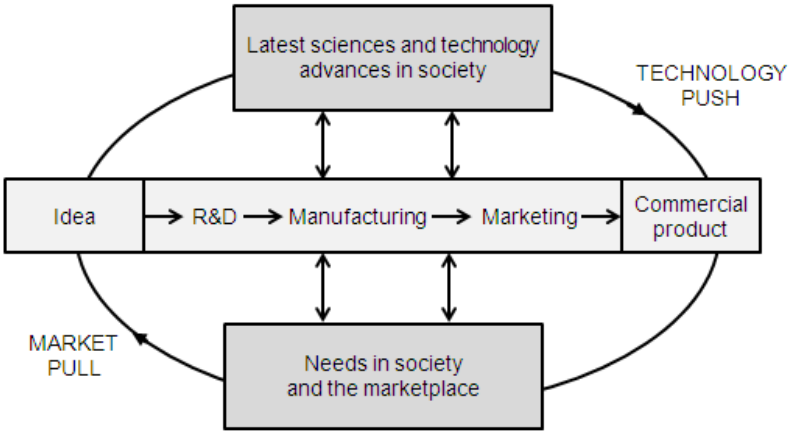

Figure 6: Interactive Model of Innovation (Adapted from Rothwell, 1994 and Trott, 2005)

In the middle of the model are presented the organizational functions: R&D, engineering, design, manufacturing, and marketing and sales. The model seems a linear as the models of technology push and market pull, but the flow of communication is not necessarily linear. Also linkages with the R&D, manufacturing and the marketplace occur between all functions. The driving forces for idea generation are the inputs from organization capabilities, the needs of the marketplace and the science and technology base. (Rothwell, 1994; Trott, 2005)

The fifth and the most recent innovation model is a network model. It has been the dominant view in the 21st century. It emphasizes the importance of knowledge accumulation and external linkages. Today companies are more committed to knowledge and technological accumulation, and strategic networks than ever, and also the speed to market has remained an important aspect of success. Greater flexibility and adaptability, and especially ´fast innovation´ is an important factor determining a company´s competitiveness. Furthermore, Rothwell (1994) argues that the ability to control product development speed can be seen as an important core competence. The network model refers to the study of Chesbrough (2003, 2006) about open innovation paradigm which is one of the leading approaches of innovation today. But this is an area which will be covered in more detail later in this study. However, this newest model

plays a strong role in this study. (Rothwell, 1994) Table 4 below summarizes the different models of industrial innovation process.

Date	Model	Characteristics	Representative studies
1950/60s	Technology push	Simple linear sequential process; emphasis on R&D; the market is a recipient of the fruits of R&D	Schumpeter (1934), Mowery & Rosenberg (1979), Freeman (1982)
1970s	Market pull	Simple linear sequential process; emphasis on marketing; the market is the source for directing R&D; R&D has a reactive role	Schmookler (1966, 1972), Meyers & Marquis (1969), Utterback, (1974), Von Hippel (1978)
1980s	Coupling model	Emphasis on integrating R&D and marketing	Galbraith (1982)
1980/90s	Interactive model	Combinations of push and pull	Cooper (1980), Rothwell & Zegveld (1985),
2000s	Network model	Emphasis on knowledge accumulation and external linkages	Rothwell (1992), Chesbrough (2003, 2006)

Table 4: Chronological Development of Models of Innovation (Adapted from Rothwell, 1994 and Trott, 2005)

Today the innovation literature is very large and complex as the cross-disciplinary can demonstrate. The following subsections explain first some traditional approaches of innovation by determining what is innovation and innovation process from product development point of view. Then the focus shifts to current popular research areas: open innovation and user-centric innovation which play a crucial part in this study.

2.2.2 Definitions and Types of Innovation

As defined in the introduction, innovation is about searching for ideas, developing and implementing them, and successfully introducing them into the marketplace as products or services (Buijs, 2007). However, there is an abundance of terminology related to innovation (Garcia & Calantone, 2002). An important distinction is normally made between invention and innovation. Fagerberg (2005) defines *invention* as the first occurrence of an idea for a new product or process, while *innovation* is the first attempt to carry it out into practice. Garcia and Calantone (2002) add the famous

commercialization point of view, arguing that inventing is discovering something new, but innovation includes the commercializing of the new discovery. Furthermore, Fagerberg (2005) asserts that to be able to turn an invention into an innovation, an organization normally has to combine several different types of knowledge, capabilities, skills, and resources.

There are several other definitions for innovation. Recent definition by Baregheh et al. (2009) takes the definition to the context of positioning in the market (see e.g. Porter, 1985; 1996): *´Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete, and differentiate themselves successfully in their marketplace.´*

Another complicating factor to the discussion of innovation terminology is that invention and innovation is a continuous process. Garcia and Calantone (2002) pinpoint two important distinctions. First, innovation process comprises the technological development of an invention *combined* with the market introduction of that invention to end-users through adoption and diffusion. Second, the innovation process is *iterative* in nature and thus, automatically includes the first introduction of a new innovation and the reintroduction of an improved innovation.

Innovations may also be classified according to ´type´. Schumpeter (1934) argued that there are five different types: new products, new methods of production, new sources of supply, the exploitation of new markets, and new ways to organize business. Van de Ven (1986) divides innovations into two categories: technical innovations and administrative innovations. The first includes new technologies, products and services, and the second one different kind of organizational functions and processes (Van de Ven, 1986).

Another approach is to classify innovations according to how radical they are compared to current technology (see e.g. Abernathy & Utterback, 1978; Galbraith, 1982, 1999; Garcia et al., 2002). From this perspective, continuous improvements are characterized as *incremental* or marginal innovations, as opposed to *radical* innovations or

technological revolutions, such as introduction of completely new product. Galbraith (1982, 1999) illustrates these different types of innovation in the Figure 7 below.

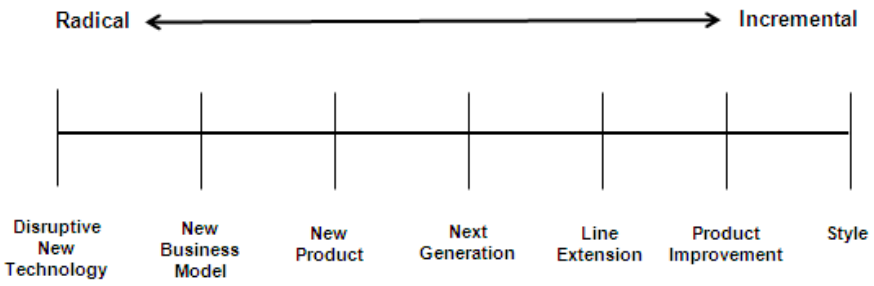

Figure 7: Innovation Types (Galbraith, 1982, 1999)

More recent categorization comes from Hamel (2007) who argues that innovation ´stack´ or pyramid has four types: operational innovation, product/service innovation, strategic innovation and management innovation. Each of these makes its own contribution to organization´s success, but *management innovation* can provide the highest levels of value creation and competitive defensibility (see Figure 8).

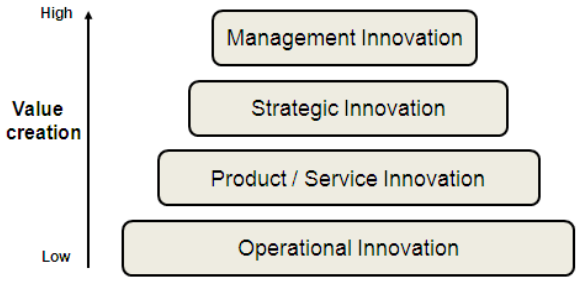

Figure 8: The Innovation Stack (Adapted from Hamel, 2007)

At the base of the pyramid is *operational innovation*. It focuses on the organization´s business processes, such as manufacturing and marketing. However, it seldom delivers a decisive, long-term advantage. Hamel (2007) argues that there are several reasons for that, such as dependent on advanced IT which has diffused rapidly, increased outsourcing, and exploitation of consultancies and their best practices, which have made companies similar with each other. The next one in the pyramid is *product/service innovation*. Hamel (2007) argues that breakthrough products or services seldom grant a

company long-lasting industry leadership. Copying a product or a service is simply and effective method for rivalries. The third one is *strategy innovation*. Hamel (2007) describes strategy innovation as a new business model that put incumbents on the defensive. Killer business model can generate billions of dollars in market value for the innovator, but on average, a distinctive business model is more easily decoded and counteracted than a heretical management system. Hence, the top of the pyramid is management innovation. According to definition by Hamel (2007):

> *´Management innovation is anything that substantially alters the way in which the work of management is carried out, or significantly modifies customary organizational forms, and, by so doing, advances organizational goals. Put simply, management innovation changes the way managers do what they do, and does so in a way that enhances organizational performance.´*

Furthermore, Hamel (2007) asserts that management innovation encompasses value-creating changes to organizational structures and roles. A new way of connecting the entities that organization consists of – business units, departments, work groups, communities of practice, and alliances with suppliers, partners, and lead customers – can constitute a management innovation. (Hamel, 2007)

One of the examples of management innovation is *open innovation* (Chesbrough, 2003). It is an area which will be covered in next subsections. However, the examples above illustrate well, how diversified innovation classification is. As Garcia and Calantone (2002) state, different terms are used to denote the same thing and the same terms are used for different meanings.

2.2.3 Towards Customer Integration in New Product Development

Schumpeter (1934) was among the first economists to emphasize the importance of *new product*s to improve economic growth. He argued that new products were more important in competition than changes in the *prices* of existing product (Schumpeter, 1934). Since that new product development (NPD) and innovation process around it

have had an important role in innovation literature (see e.g. Brown & Eisenhardt 1995; Chesbrough, 2003) and companies´ activities. However, this area has become more challenging than ever. Constantly rising development costs, shorter product life cycles, increased level of competition, and more turbulent business environments have forced companies to seek new approaches to their innovation processes, organization models and decision making. For example, companies are increasingly trying to improve their innovativeness, as well as to gain savings from outsourcing R&D. However, perhaps the most significant activity has been the involvement of customers in their innovation processes to ensure the attractiveness of their solutions. (Tidd & Bessant, 2009)

Innovation process and its evolution were illustrated earlier by using Rothwell´s (1994) model of innovation processes. These models were technology push, market pull, coupling model, interactive model and network model. As Rothwell (1994) presented the focus is now shifting into innovation processes that exploit both internal and external resources.

There are numerous different models to present the process of new product development, which in this study includes the new service development (NSD) as well. Typically these models start at ideation process and ends with the commercialization of the product. One common model is an eight-stage linear model presented in the Figure 9 below. (Trott, 2005)

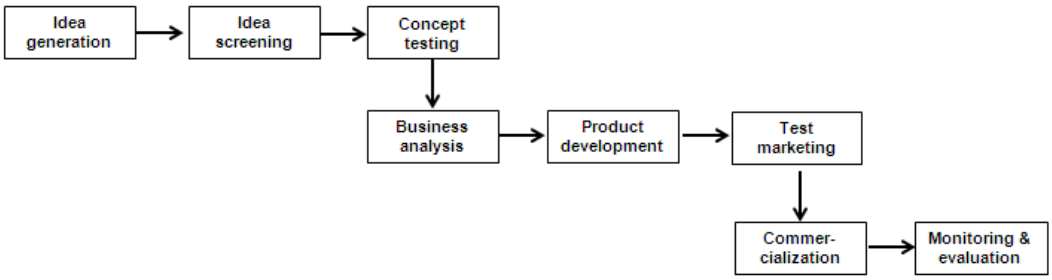

Figure 9: New Product Development Model (Adapted from Trott, 2005)

However, this linear model has been widely criticized (Trott, 2005). Traditional approach on product development has been a highly closed process and involved only a

few people in the organizations (Bröring & Herzog, 2008). Typically the company itself and its business units have been in responsible for all the stages of innovation process. However, these activities have suffered from lack of interaction – internal and external (see e.g. Trott, 2005; Chesbrough, 2003).

However, the new challenges described above force organizations to enrich their NPD processes by using external knowledge, which can be brought in by employees from related industries the organization is aiming at, or by internal and external collaborations (Bröring & Herzog, 2008). Innovation developers have often lack of knowledge of user´s preferences and requirements (Ribiere & Tuggle, 2010). Therefore, the importance of external resources, such as customers, suppliers, and innovation partners are crucial. This study focuses most on the customer side.

The potential of customers as an external resource has been recognized in theory and practice for a long time (e.g. von Hippel, 1978). Customer involvement in NPD enhances product concept effectiveness, a product-market fit, and may result in ideas for potential business opportunities (e.g. von Hippel, 1986; Prügl et al., 2006). Furthermore, it helps the access to sticky information on user needs, user context and user experience, which is usually tacit and difficult to find (von Hippel & von Krogh, 2006). It also helps to lower barriers to adopt new innovations (Alam, 2006), and gain benefits in marketing, branding, and customer relationship areas (McAlexander et al., 2002).

Customer´s role has transformed from passive objective into active participant, co-creator and innovator. This transformation is even emphasized in the current transformation of companies from product-oriented companies towards service companies. Chesbrough (2011) argues that in the new service development (NSD), customer experience is seen at the center of a business´s purpose. (Chesbrough, 2011)

However, customers have played a limited and largely passive role in the new product development in most industries (Wayland & Cole, 1997). Researchers (e.g. Alam, 2006; Piller et al., 2005) have found several reasons for that. For example, companies have poor connectivity with their customers, and therefore lack of customer cooperation leads

to existing information gap between companies and customers. In other words, companies do not know what customers really want. Furthermore, there are risks of confidentiality and lack of knowledge of how to interact with customers. (Alam, 2006)

One answer to that dilemma has been found in new technology. Different technological solutions can support the connectivity between customers and firms in a cost-effective way. Furthermore, the new technology supports customer involving as partners of innovation in new models of product development. Especially with online tools and services, customers can be involved, not only in idea generation for new products, but also in co-creating them with companies, in testing finished products, and in providing end user product support. (Nambisan, 2002) Furthermore, in order to exploit the potential of customers, more open-ended approach to concept testing is needed. It encourages users to evaluate concepts more critically. (Heiskanen et al., 2007).

It is justified to say according to discussion and references above that the transformation of customer role and focus in new product development and in business general has been clear in recent years. Sawhney and Prandelli (2000) have described this development well as: *´a transformation from a perspective of exploiting customer knowledge by the company to a perspective of knowledge co-creation with the customers.´* This transformation needs a new process model to cope the challenges that it involves in order to exploit the potential of customers. For that purpose *open innovation* model has been selected for the most relevant innovation process model for this study. In the following subsection, this famous and popular model is described.

2.2.4 Open Innovation – Collaborating with Customers

Open innovation has become one of the most influential innovation topics since Chesbrough introduced the term in 2003. Open innovation paradigm suggests that companies can and should use external as well as internal ideas and paths to market to achieve long-term success in today´s fast-moving market environment (Chesbrough, 2003). Chesbrough (2006b) defines open innovation in the following way:

> *´Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open innovation is a paradigm that assumes that companies can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology.´*

One way to understand better open innovation is to compare it with *closed innovation* paradigm. Traditionally, large firms relied on internal R&D to create new products. Large internal R&D labs were strategic asset and represented a considerable entry barrier for potential rivals. As a result, large firms with extended R&D capabilities and complementary assets could outperform their smaller rivals. (Teece, 1986) However, this traditional approach which Chesbrough (2003) calls closed innovation is not relevant anymore. Chesbrough (2003) argues that there is an innovation paradigm shift from closed to open innovation model. According to Chesbrough (2003) closed innovation springs entirely from internal company innovation activity, largely in the form of organized R&D. Open innovation, instead, springs from external sources of a company, in combination with internal innovation activity. (Chesbrough, 2003)

At the company´s process level, Gassmann and Enkel (2004) have identified three archetypes of core processes in companies following open innovation approach: the inside-out process, outside-in process, and coupled process. The *inside-out process* is about bringing ideas to markets, and selling knowledge and intellectual property (IP) in different markets. The *outside-in process* refers to cooperating with customers and suppliers, and sourcing outside knowledge to the company, for example from customers, to enhance company´s innovativeness. Finally, the *coupled process* is linking inside-out and outside-in processes by working in alliances with complementary firms. (Gassman & Enkel, 2004)

In other words, open innovation combines internal and external ideas into architectures and systems. For example, open innovation treats R&D as an open system where internal and external actors participate. Open innovation paradigm is presented in the Figure 10 below. (Chesbrough, 2003)

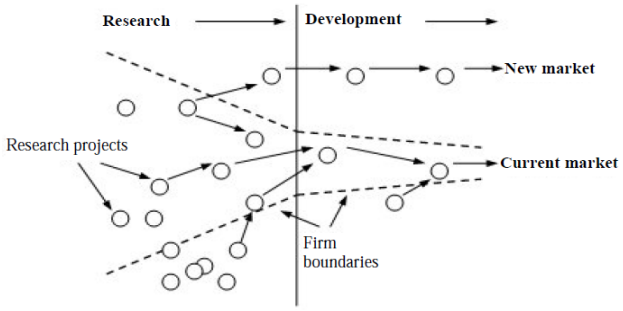

Figure 10: Open Innovation Paradigm (Chesbrough, 2003)

One of the key messages of open innovation is that, valuable ideas can emerge and be commercialized from inside or outside the company (Chesbrough et al., 2006). Therefore, many firms rely on both inbound and outbound open innovation simultaneously (van de Vrande et al., 2009). Open innovation argues that not all the smart people are in your company. They are now inherently more accessible, and others will use them if you do not. This includes also the customers. Hence, companies should find ways and methods to acquire this external knowledge. Open innovation paradigm provides ideas for that purpose. (Chesbrough, 2003)

Chesbrough (2003) mentions a number of factors which constitutes open innovation, including greater ties to university research, greater decentralization of internal R&D, and greater reliance on innovation by component suppliers. Different kinds of inter-firm ties can also enable open innovation (Simard & West, 2006).

There are several economic justifications and motives for open innovation, including there is too much outside the company to ignore and costs of internal development are rising. These challenges force a more rapid pace of innovation. Furthermore, an emergence of intermediate markets for IP, and an increased division of innovation labor, as well as access to it are increasing. Hence, open innovation will be the game changer for most industries. (Chesbrough, 2006a) Furthermore, open innovation can also help firms in improving the effectiveness and efficiency of internal R&D efforts (Chesbrough et al., 2006). According to van de Vrande et al. (2008) market considerations and knowledge creation are the key motives for open innovation.

However, open innovation includes managerial challenges. Van de Vrande et al. (2008) argue that the most important challenges relate to organizational and cultural issues. One example of that is classical not-invented-here (NIH) syndrome. Chesbrough et al. (2006) argues that NIH syndrome and lack of internal commitment are the main hampering factors. Other potential barriers for open innovation include bureaucratic elements, lacking resources, free-riding behavior, and problems with contracts (Boschma, 2005; Hoffman & Schlosser, 2001; Mohr & Spekman, 1994).

In addition, it is not necessary to start developing all the projects from scratch, instead it is wise to seek what competitors and other companies are doing, and then adjusting those early developed ideas for own purposes. Chesbrough (2006a) argues that it is more important to develop appropriate business model than be the first in the market.

There are several companies, such as IBM, Intel and Procter & Gamble, which have adopted the concept of open innovation successfully. Nowadays, some managers are even arguing that open innovation is no longer a source of competitive advantage, it has become a competitive necessity. (Chesbrough et al., 2006)

Open Innovation & Change Management

Change management was covered earlier, but this chapter focuses on the open innovation point-of-view. The shift from closed innovation to open innovation means a change in the company. For example, Chiaroni et al. (2010) have studied this research area. They have examined the changes in a company´s organizational structures and management systems when the company shifts from closed to open innovation. Chiaroni et al. (2010) argues that this shift can be conceived as an organizational change process, and therefore it is reasonable to use approaches and instruments developed by organizational change research (see e.g. Mintzberg, 2009; Kotter & Cohen, 2002) when studying this process. Chiaroni et al. (2010) have found that this shift, or journey as they call it, involves four main dimensions of the firm´s organization along which change could be managed and stimulated: inter-organizational networks, organizational structures, evaluation processes, and knowledge management systems.

The inter-organizational networks refers to the finding that implementation of open innovation requires an establishment of extensive networks of inter-organizational relationships with a number of external actor, such as universities and research institutions, suppliers, and users. Furthermore, Laursen and Salter (2006) have found two variables: search breadth and search depth, which improve the firm´s ability to improve the network dimension, and thus implement inbound open innovation. Search breadth refers to increasing the number of external sources or search channels, and search depth increasing the extent of different sources or channels.

Internal reorganization of organizational systems that focus on accessing and integrating the externally acquired knowledge into the firm´s innovation processes are needed. This might include the following: organizational structures, e.g. establishment of independent open innovation business units, task forces or dedicated cross-functional teams; organizational roles, e.g. champions who lead the change process or gatekeepers who manage the interface between the firm and its external environment; and rewarding and incentive systems, which support open innovation initiatives. (Chiaroni et al., 2010)

The evaluation processes for evaluation of innovation opportunities and projects are also needed. The openness of the innovation system complicates the evaluation because external inputs increase technical and market uncertainty. Therefore, the evaluation process should be designed to manage this higher uncertainty, for example continuously scanning and monitoring external market opportunities and new uses of external sources, such as users, in the firm´s innovation process. (Chiaroni et al., 2010)

Finally, knowledge management systems refers to the key idea of open innovation: open innovation is in fact all about leveraging and exploiting knowledge generated inside and outside the firm, to develop and exploit innovation opportunities. Therefore, open innovation requires knowledge management systems that are able to support the diffusion, sharing and transfer of knowledge within the firm and within the external environment. For that purpose the role of ICT has been widely acknowledged (see e.g. Huston & Sakkab, 2006). (Chiaroni et al., 2010)

Chiaroni et al. (2010) emphasize that changes occurring along one of the four managerial levers presented above have an impact along the other levers. For example, when the scope and size of the network of external organizations or individuals (e.g. customers) grows, a firm needs to develop dedicated knowledge management systems to support its operation. (Chiaroni, et al., 2010)

However, open innovation has limitations too. It has been accused to be a management fad instead of a theoretically sound concept (Trott & Hartman, 2009). Open innovation embraces that knowledge sharing and collaborative innovation are the best ways for value generation. However, this idea is in contravention of the RBV theory presented earlier (see e.g. Barney, 1991). RBV theory argues that development of competitive advantage happens through the company´s ownership of valuable and rare resources, which are difficult to imitate or substitute (Barney, 1991). Therefore, companies should carefully consider *when* open innovation is an appropriate model for innovation.

For that discussion, however, Chesbrough (2003) itself has identified problems. He argues that one problem for open innovation is that firms integrating internal and external innovations can face higher coordination costs and risks than if all activities were internalized. Hence, it is important for companies adopting open innovation that they understand the costs and risks that may appear, as well as the benefits of open innovation. Open innovation entails considerable transaction costs for the search and evaluation of external knowledge sources whose quality and usability cannot be known beforehand. Hence, the fit with the firm´s goals is uncertain. (Chesbrough, 2003)

It was said that open innovation is about integrating external partners in the entire innovation process. This should happen not just in the idea or technology development phase but also in all other phases towards market acceptance. To get the innovation efforts towards market needs there is another area to cover: user-driven innovation. Eric von Hippel (e.g. 1978, 1986, 2005) suggests that users can become a key part of the innovation process. When open innovation takes companies to the next step by providing more opportunities through external partners, user-centric innovation takes

the innovation efforts towards market – user – needs. The next subsection focuses on that interesting area: user-centric innovation.

2.2.5 User-Centric Innovation

The importance of users in the innovation process has been increasing since von Hippel (1976) pointed at them as sources of innovation. Traditionally product innovations were typically developed by product manufacturers, but this has been seen often as a wrong assumption (von Hippel, 1988). However, von Hippel (1988) argues that there are four sources of innovation that vary greatly: 1) suppliers and customers; 2) university, government, and private laboratories; 3) competitors; and 4) other nations. For example, in some fields the users of innovation develop most innovations, but in some other fields, suppliers of innovation-related components and materials, or traditionally product manufacturers are typical innovators. This study focuses on the users.

According to von Hippel (2005), users are *´firms or individual consumers that expect to benefit from using a product or a service. In contrast, manufacturers expect to benefit from selling a product or a service´*. Users directly benefit from innovations, whereas all others must sell innovation-related products to users to profit from innovations. This is easier if firm uses user-centric approach in innovation. (von Hippel, 2005)

User-centric innovation means that customers involve directly in the development and deployment of new products and services (von Hippel, 2005). It has also been referred as ´outside innovation´, ´mass collaboration´, ´wikinomics´ and ´crowdsourcing´ (World Economic Forum, 2008). However, this study uses the term ´user-centric innovation´.

There have been several studies on user-centric innovation. Studies on lead user innovation were conducted on product development process (von Hippel, 1986). According to von Hippel (1986) lead users face needs that will be general in a marketplace, but face them months or even years before the bulk of that marketplace encounters them. In addition, lead users are positioned to benefit significantly by

obtaining a solution to those needs. (von Hippel, 1986) The sources of innovation (von Hippel, 1988, 2005) was mentioned earlier. Malerba et al. (2007) have studied users´ contributions in the development of new technologies. Prügl and Schreier (2006) have examined users´ role in generating content and extending toolkits. Furthermore, Lettl (2006) has researched users´ entrepreneurship role generating radical innovations.

The study of Reichwald and Piller (2005) is interesting for this study. They have focused on the cooperation of manufacturers and users. They have found three different modes of collaboration between manufacturers and users in new product development. In Mode 1 companies listen to customers by utilizing different indirect collection methods, such as websites and search portals in order to explore unknown customer needs. In this Mode customers are considered as passive targets of observation. In Mode 2 companies are in a dialogue with customers. They ask customers about new product features or concepts by using, for example surveys and web-based analysis to know customer preferences and needs. In Mode 3 customers take part in designing the product. They are equal partners of the organization for innovation. Companies offer tools and lead user workshops for customers to enable design by customers. Furthermore, users can establish their own platforms or communities to design products.

There are many reasons why firms are involving customers into their innovation process. According to Hyysalo (2009) the key advantage of user-centric approach is that it provides detailed understanding of how and why users work and what they want. User information connects market and customer information (Hyysalo, 2009). Furthermore, empirical studies on the sources of innovation have revealed that in the fields of both industrial and consumer goods, users are often the initial developers of products, prototypes and processes which later gain commercial significance (von Hippel, 2005). Edvardsson et al. (2006) introduce the interaction of customers and firm´s innovation process and its different stages. They show that firms have different purposes for customer involvement in their different stages of innovation process (see Table 5).

Purpose of customer involvement	Stage of customer involvement
Acquire information about users / customers	Business planning
Get new ideas	Innovation, idea generation
Adapting products / services	Prototyping
Debugging	Testing
Control the customers´ experiences	Usage
Teaching customers and learning from them	All stages

Table 5: Different purposes and stages for customer involvement (Edvardsson et al., 2005)

The above table clearly shows that firms want to get closer to their customers in order to offer them better products and services. Hence, customers are proving to be useful and growing source of innovation. Furthermore, Prahalad and Ramaswamy (2004) argue that customers have become active constituents of value creation. The customers have become active co-creators who interact with customer communities and networks of firms to satisfy their own unique requirements. Hence, the success in future of competition depends on co-creating value with customers, not designing products and services that meet the company´s view of customer needs – no matter how competently they can do this. (Prahalad & Ramaswamy, 2004)

However, using of user information and involving with customers are not easy tasks. According to Hyysalo (2009) it is complicated and long-term effort to involve user information into the R&D and as a part of competitive advantage. Appropriate methods depend on project, user group and technology. However, the key point is to research and understand users´ behavior and the hidden beliefs and values behind that behavior. For that purpose Hyysalo (2009) lists following methods: own experience, direct cooperation with users, observation, interviews, surveys, usability tests, focus groups, building of models and prototypes with users, and exploiting published data.

User-centric innovation has strong connection with open innovation. Prügl (2006) has studied users´ innovativeness on the development of new radical innovations and product development capabilities, whereas Hienerth (2006) users´ role in the industry

development and commercialization. Dodgson et al. (2006) have studied user´s innovativeness as part of the innovation process through the use of technology.

Open innovation has different actors and intermediaries (Chesbrough, 2006). Typical actors in the open innovation approach are suppliers, universities and other research institutes, competitors, and customers. Chesbrough et al. (2006) have found that the role of innovation intermediaries is rising when innovation becomes a more open process. Intermediaries are specialist firms that provide information, access, and financing to enable transactions to occur. (Chesbrough et al., 2006)

As the discussion above proves, user-centric innovation is important for firms. However, this participation with users can be characterized as emergent, lacking structure and governance (Almirall & Wareham, 2008). Hence, new sources of innovation demand new management tools and new organization (von Hippel, 1988). One of the prominent tools is to use *living lab* which will be covered in Chapter 3.

2.3 Summary of Literature Review

This section summarizes the Literature Review and provides a conceptual framework to understand the relationship between strategy and innovation.

Strategy and management literature was covered by presenting a brief overview of how the study area has evolved, and focusing on strategy and change literature in the context of growth. Strategy was seen an extraordinarily demanding, complex and subtle discipline. However, Mintzberg et al. (2009) have found some general agreements on strategy, including strategy affects overall welfare of the organization, and it involves issues of both content and process. Strategy was also seen as the guiding principle for the organization. Typically organizations are trying to achieve growth. Hence, Ansoff´s (1957) legendary growth matrix was presented to understand different growth strategies. Furthermore, growth is seen possible through different resources, capabilities and competencies (Barney, 1991; Teece, 1997; Prahalad & Hamel, 1990). Finally, the

chosen growth strategy and required capabilities to implement it usually needs change in the company. Therefore, Mintzberg´s (2009) change cube was provided to understand that change is multidimensional: it can be about strategy and about organization. If the company wants to change something, it has to consider both of these.

Innovation management literature provided a brief overview of how the study area has evolved, and also presented the current trendy topics of innovation, including open innovation and user-centric innovation. Also innovation was presented to be a multidimensional subject. It has roots for example in strategy. This is a one reason why innovation and strategy have closed relationship as the following chapters will present. Recently the innovation literature had focused on what drives innovation: the market conditions (the market-based view) and available resources and capabilities (the resource-based view). Furthermore, different innovation models were presented which showed that innovation is becoming more complex with different stakeholders involvement and new focus areas: collaboration and users.

Recently, innovation has becoming towards user integration. This has strong influence on new product development which is a typical innovation process. Furthermore, open innovation (Chesbrough, 2003) was presented to be one of the main topics of innovation today. It focuses on collaborating with external partners, including users. User-centric innovation (von Hippel, 1988, 2005), which means that customers are involved directly in the development and deployment of new products and services, has become an interesting topic among researchers and organization. User-centric companies are profiting more from innovations.

The Relationship Between Strategy & Innovation

As the previous sections have presented, strategy and innovation have closed relationship in management literature and business life. Innovation is seen as a factor that affects the corporate strategy: both formulating and implementing the strategy. Recently, there has been a growing interest in the effects of innovation, and particularly, an innovation orientation on strategy and performance of companies (see e.g.

Christensen & Raynor, 2003, Christensen et al., 2004). Innovation is seen as a differentiator that will lead to the next level of competitive advantage (Prahalad & Hamel, 1990). Furthermore, Chesbrough et al. (2006) describes innovation as a critical dimension of any dynamic approach to business strategy, because it allows company to achieve and defend competitive advantage.

Dobni (2010) underlines that the strategy chosen in organization is related to several factors, including the mission, objectives, resources – and innovation orientation. The innovation orientation describes how innovative an organization is. It provides a context for the implementation of proactive growth-based strategies. This context includes the intention to be innovative, the infrastructure to support innovation, operational level behaviors to influence value orientation, and environment to support the implementation of innovation. These dimensions have influence on strategy, and finally to the performance of the company. This relationship is presented in the Figure 11 below:

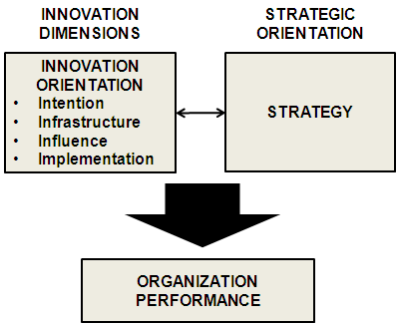

Figure 11: Relationship Between Strategy & Innovation (Adapted from Dobni, 2010)

Organizations that possess high innovation orientations engage in value creation strategies, such as market segmentation, developing new products for new markets, and product customization. Whereas, organizations with lower innovation orientation practice less aggressive and internally focused strategies de-emphasizing for example customer service, brand reputation and co-operation based strategies. (Dobni, 2010)

Furthermore, Martins and Terblanche (2003) argues that if a company want to flourish innovation and strategy, they have same foundational determinants, including

objectives, customer focus, management processes, leadership, support mechanisms, and employee constituency. Wang and Ahmed (2006) define organizational innovativeness as *´an organization´s overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behavior and process.´* Therefore, innovativeness can be seen as multi-dimensional, including strategy.

It has been argued that the necessity to develop innovation is driven by the type of strategy employed (Chenhall et al., 2011). Therefore, strategy and innovation are often placed alongside each other. They are complementary and powerful when they co-exist and are effectively leveraged. Innovative organizations have also explicitly linked strategy to clear innovation objectives and addressed all elements of innovation capability, including idea management, technology and resource management, and the product/service development. (Dobni, 2010)

Furthermore, organizations with a strategic logic build and leverage capabilities and competencies to support innovation. With their innovation blueprint they are able to better define, engage and pursue uncharted market space. (Dobni, 2010) This is similar with the typical RBV discussion: achieving strategic goals needs resources, capabilities and competencies (see e.g. Teece, 1997; Venkatraman & Subramaniam, 2002; Prahalad & Hamel, 1990). They are also the fuel for innovation, not just for strategy.

Enhancing the innovative ability in organizations is one of the most important methods to increase profitability and growth (Dobni, 2010). For example, according to the study conducted by management consultancy Arthur D. Little (2006) innovation excellence can boost EBIT (earnings before interest and taxes) by four percent and top innovators have 2.5 times higher sales of new products. Hence, it is not a surprise that innovation is high on CEOs agendas (IBM, 2006, 2010). Innovative firms are more successful over the long term. They have a desire to succeed, possess a common sense of purpose and constituency, and are empowered. (Dobni, 2006; Govindarajan & Trimble, 2005)

To sum up: strategy and innovation have closed relationship in literature and business life. They are in constant ´tension´ with each other. Strategy forms the foundation for innovation, the direction, the guidelines for objectives and the context where to innovate, whereas innovation supports achieving strategic goals, thus implementing strategy. Furthermore, innovation enables the change of current strategy by reshaping and challenging the mental models and conventional wisdom.

Both strategy and innovation have different outcomes. Typical strategy outcomes are growth (typical target for many companies), competitive advantage (improved ability to prosper in competition), increased value for different stakeholders (e.g. owners or customers), and brand improvement (improve growth and image). Typical innovation outcomes are new products, services, concepts and even new business models. Furthermore, innovation enables to expand to new markets, thus to acquire new customers. Successful innovation also supports the organizational culture to value for example creativity, risk taking, teamwork or being value seeking and solutions oriented.

The content of strategy and innovation constantly ask questions, such as, what business are we in, who is the customer, what products and services to offer, and how to do this. Finally, both strategy and innovation have influence on the performance of the organization. The following Figure 12 forms the contextual framework to understand the relationships between strategy and innovation for this research:

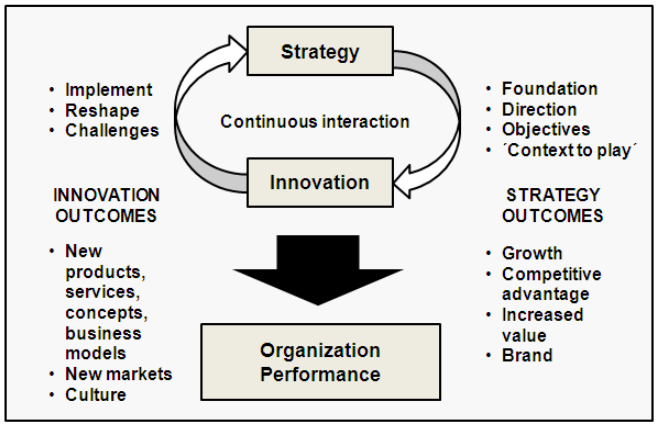

Figure 12: Contextual Framework of the Study

3 LIVING LAB

This chapter presents the living lab concept. First, living lab is presented in the context of earlier research, interview of living lab expert and other relevant materials in order to understand the empirical phenomenon better. Second section provides a benchmarking study of existing living labs.

3.1 Living Lab

Living lab is an emerging research concept which explores the relation between networks and innovation, which is currently a popular topic among researchers and business people (Katzy & Klein, 2008). In the traditional R&D environment researchers are engaged in the development of new products and services to meet perceived market needs which, however, many times do not materialize (Oliveira, 2010). Living lab concept is about moving out of laboratories into real-life contexts, and therefore entails a major paradigm shift for the whole innovation process (Oliveira, 2009).

Living lab has been adopted especially in European research area since 2000s through different European strategic innovation programs. These programs brought together networks of academic research, industry and public administrations in collaborative research programs. The term ´living lab´ was introduced broadly to the public discussion by the then Finnish Prime Minister Matti Vanhanen during Finland´s term as EU presidency in 2006. According to Mr. Vanhanen, living lab´s purpose is to act as a new innovation tool to reply to the apparent innovation performance lack of Europe, the so called Lisbon agenda, for turning new advanced research into job creation and economic growth. (Katzy & Klein, 2008) Therefore, several European countries founded the European Network of Living Labs (ENoLL) in 2006 to enhance innovation. It was the first step towards a New European Innovation System (EIS). (Finnish Government Communications Unit, 2006)

To approach living lab conceptually, several academic domains link the discussion to networked innovation, also known as open innovation as Chesbrough (2003) calls it.

Open innovation and living lab share the belief that inter-organizational collaboration becomes increasingly relevant for innovation, as well as external collaboration. Living lab concept also refers to firm´s R&D questions. For example to understand R&D processes and projects in networked settings, and what managerial, organizational and technological infrastructures are needed to support them. (Katzy & Klein, 2008)

The phenomenon of living lab emerges alongside the current trend of research, development and innovation increasingly moving outside of the traditional boundaries of the firm. Living lab furthers traditional laboratory research by engaging in real-life environment. While the laboratory is a controlled environment, living lab is living: it is constantly changing and evolving. Living lab enables an environment for experimenting and engages the research in the process. (Oliveira, 2009 & 2010)

Many of the living labs address innovations in the industries which are shifting from a product based industry to a service based industry. For example, telecom, information and media industries are using living labs. (Katzy & Klein, 2008) Also public sector is using living labs to tackle major challenges, such as health and ageing problems (Oliveira, 2010).

3.1.1 Definition and Purpose

There seem to be a broad agreement that the term living lab can refer to a range of environments or approaches to innovation and development. In Table 6 below different scholars and other sources have been listed and their definitions on living lab have been stated.

Scholar(s)	Definition
Mitchell (1990s in Eriksson et al., 2006)	Living lab represents a user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts
Oliveira, (2010)	Living lab is a user-driven open innovation ecosystem where the user (citizen, resident, worker, student, visitor, customer) lives, works, studies, plays and entertains.
Følstad, (2008)	Living lab is an environment for innovation and development where users are exposed to new ICT solutions in (semi)realistic contexts, as part of medium- or long-term studies targeting evaluation of new ICT solutions and discovery of innovation opportunities.
Katzy et al. (2005)	Living lab is an open innovation system, in which companies, governments and industry interact around complex projects in different societal domains
Peltomäki (2009)	Living lab is an open innovation environment in real-life settings, in which user-driven innovation is fully integrated within the co-creation process of new services, products and societal infrastructures
Gall & Burn (2008)	Living labs are defined as firms, public authorities and citizens that work together to create, prototype, validate and test new services, businesses, markets and technologies in real-life contexts.
Almirall & Wareham (2008)	Living lab is a small organization that aims to capture users´ insights, prototype and validate solutions in real-life context.
Mulder, et al. (2008)	Living lab represents, mostly regional, innovation environments focusing on user communities embedded within real-life.
Eskelinen (2011)	Living lab is an ecosystem for user-driven innovation which is sited in exclusive region.

Table 6: Definitions of Living Lab

Even though there is not a single description of living lab, there are some common perspectives that ´make´ a living lab. Janne Orava (2009) who has studied the living lab environment in Finland pointed out four perspectives: user-centric, open innovation, ecosystem and real-life environment. User-centric refers to active user involvement and empowerment in organization´s RDI activities. Open innovation emphasizes that RDI activities are performed also with external partners, including users. Ecosystem refers to the idea that the participants, including organization, personnel, users, researchers and experts, form a network of operation. Finally, real-life environment emphasizes the environment where living lab exists and operates. It is an environment where users use the product or service as a part of his/her daily routines. In summary, it can be said that *living lab is user-centric, open innovation ecosystem in a real-life environment*.

When discussing the purpose of living lab, European Network of Living Labs (ENoLL) emphasizes that living lab employs four main activities (Oliveira, 2011):

- Co-Creation: co-design by users and producers
- Exploration: discovering emerging usages, behaviors and market opportunities
- Experimentation: implementing live scenarios within communities of users
- Evaluation: assessment of concepts, products and services according to socio-ergonomic, socio-cognitive and socio-economic criteria.

Furthermore, living labs have been characterized by the European Commission as Public-Private-People Partnerships (PPPP) for user-driven open innovation. (Oliveira, 2011) Living lab acts as an intermediary of different actors (Eskelinen, 2011). However, the interviewed living lab expert and Vice Chairman of ENoLL Jarmo Eskelinen (2011) emphasized that living lab does not need to comply ENoLL´s definition of PPPP ecosystem. It is not necessary that living lab has public, private and user actors. For example, this study supports that claim as Chapter 5 presents that case company´s Living Lab does not have public actor. Eskelinen (2011) emphasizes that the key criteria to become a living lab is to have specific living lab methodology or methodologies. According to Eskelinen (2011) the main purpose of living lab is the following:

> *´Living lab can be used to develop product, service or other concept despite in which stage of the life cycle it is. When the methods are chosen appropriately, living lab can be used for generating ideas, benchmarking ideas, picking up the ideas to conceptualization or prototyping. In addition, the existing product or service can be brought to living lab for reassessment.´*

In addition, living lab enables quicker and more efficient product or service development with a higher success ratio. It also assists to reduce waste percent. Furthermore, living lab enables to get information based on real life, how the product or service functions in the real life´s operating situation. The gained information bases on real use, not for example on optimization. (Eskelinen, 2011)

3.1.2 Theoretical Foundation & Research

The research of living lab is rather young, only about a decade. Furthermore, living lab has not become a mainstream research area. However, the research of living lab exploits the research of other disciplines and other areas, such as user-centric innovation and open innovation – as this study does.

The living lab concept originates from Massachusetts Institute of Technology (MIT). It was developed by departed Professor William J. Mitchell of the MIT Media Lab and School of Architecture and City Planning. According to Mitchell, living lab presents a user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts. (Eriksson et al., 2006)

The first living labs were in the area of smart/future homes in the 1990s. Living labs were built to look like a real home where people (visitors) were observed through sensors and cameras in their usage of emerging technologies in the setting of a real home. Usually people stayed in these homes for several days. (Eriksson et al., 2006)

In general, Mitchell´s concept of living lab was more closed environment than current living labs are. His living labs focused on testing ideas of city planning with residents. He pioneered new approaches to integrating design and technology to make cities more responsive to their citizens and more efficient in their use of resources. The idea behind the living lab was that Mitchell wanted to explore is there room for service patterns in peoples´ everyday life. According to Mitchell, the reason why people neglect something is the balance between benefits from accomplishing a certain task and an effort of performing the task. For example, people are not using a specific service because it takes too much time compared to benefits. (Eskelinen, 2011)

Mitchell argued that it is not possible to examine the issue of service patterns by conducting focus group research, user study or laboratory research. Instead, a new method is needed: living lab. There is a need for a real environment where all of the contradictions of time exist. Only a living lab can show comprehensively enough, is a certain service befitting in users´ everyday life or not. (Eskelinen, 2011)

According to Følstad (2008), the origin of living lab has dual roots: mostly regional innovation activities, such as Mitchell´s work, and the ongoing conceptual work in the innovation management field. Especially von Hippel´s (1988, 2005) research on co-creation and users as innovators offers a strong theoretical background for living lab. According to Eskelinen (2011) von Hippel´s research on user-centric innovation in 2000s boosted the phenomenon of living lab in Europe. Von Hippel´s research gave a theoretical background why it is worthwhile to operate living labs. (Eskelinen, 2011) For example, Oliveira and von Hippel (2009) have shown in their research that users developed 90% of important retail services.

From traditional new product development (NPD) perspective (see, e.g. Trott, 2005) which was covered in earlier Chapter 2, living lab brings a fundamental difference. In traditional model typically supplier or the company itself has the key role in NPD. Customers or users are used only for getting feedback from them, whereas in living lab model customers are the key. They have role not only in feedback phase, but also in design, building of prototypes, testing and analyzing the results. These activities are done together with the supplier which is also responsible for advanced development. The traditional and living lab approach on NPD is presented in the Figure 13 below:

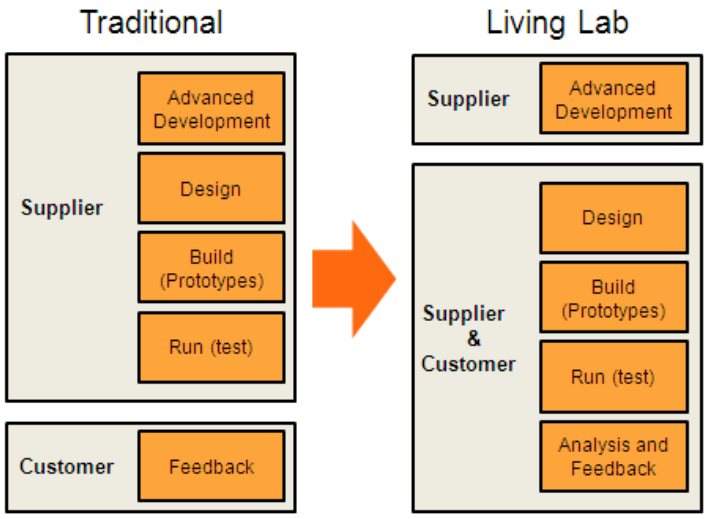

Figure 13: Traditional and Living Lab Approach on New Product Development

There are also some other areas of research that have provided impact on the theoretical foundation of living lab. For example, test and experimentation platform (TEP) framework of Ballon et al. (2005) is one of them. TEP has been used to understand living lab´s relation to other test and experimentation platforms. Different TEP types are shown in Table 7 below.

TEP Type	Definition
Prototyping platform	A design and development facility used prior to mass production and resulting in the first proof-of-concept of a new technology, product or service
Testbed	A standardized laboratory environment used for testing new technologies, products and services and protected from the hazards of testing in a live or production environment
Field trial	A test of technical and other aspects of a new technology, product or service in a limited, but real-life environment
Living Lab	An experimentation environment in which technology is given shape in real life contexts and in which (end) users are considered 'co-producers'
Market pilot	A pilot project in which new products or services that are considered to be rather mature, are released to a certain number of end users in order to obtain marketing data or to make final adjustments before the commercial launch
Societal pilot	A pilot project in which the introduction of new products and services into a real-life environment is intended to result in societal innovation

Table 7: Typology of Test and Experimentation Platforms (Ballon et al., 2005)

The relation between different test and experimentation platforms can be analyzed through conceptual framework of test and experimentation platforms developed by Ballon et al. (2005). The framework considers three central characteristics of TEPs. First, the technological readiness is represented on the horizontal axis. Technologies and their applications can be either close to market ready or immature. Second, the focus of the TEP is either on testing or design as the vertical axis´s scale shows. Finally, the degree of openness, ranging from in-house activities (R&D) to open innovation platforms, shows the final difference. These aspects and living lab´s relation to other test and experimentation platforms are illustrated in Figure 14 below. (Ballon et al. (2005)

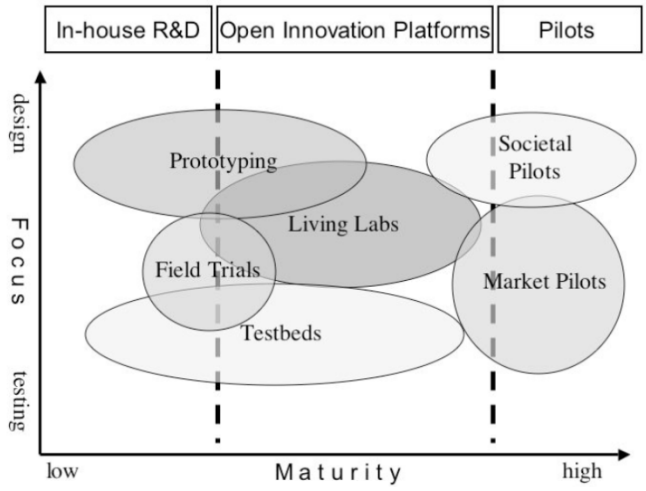

Figure 14: Conceptual Framework of Test and Experimentation Platforms (Ballon et al., 2005)

The framework presents that living lab is an open innovation platform which focuses on both designing and testing of technologies which are neither market ready or immature. The relationship between living lab and open innovation will be covered next.

Almirall and Wareham (2008) have explored the conceptual relation between living lab and open innovation. Their study links to the major change in companies´ operational environment, such as the expansion of amount of data and information flow due to rapid technology development and globalization. Previously companies used information to run the business and manage the business processes, but now there is a growing need to establish more value through more mature use of information. Information should be used to enable innovation and even as a competitor differentiator. (Kiron et al., 2011)

On the other hand, this broadening and expanding amount of data and information flow leads to challenging filtering problem: how to be aware, reach and select the right ideas. This problem is even greater when the user contribution is added. Living lab aims to contribute to both of these problems by providing structure and governance to the user involvement and methodologies and organizations to filter and sense user insights. (Almirall & Wareham, 2008)

Importance of users in the innovation process was presented in the Literature Review earlier. For example, von Hippel (1988, 2005) has shown users as sources of innovation. In addition, users have contributions in the development of new technologies (Malerba et al., 2007), through generating content and extending toolkits (Prügl, 2006) and even in an entrepreneurship role generating radical innovations (Lettl et al., 2006).

Open innovation (Chesbrough, 2003) postulates, as presented earlier, companies should be open to outside ideas to exploit more opportunities. However, this leads to the filtering problem presented above. In this case, companies are struggling to select the right partners and the most suitable ideas. Hence, companies need more structural approach and governance for open innovation activities. (Almirall & Wareham, 2008)

Living labs are one key to tackle this challenging issue. Because living labs are innovation areas where users co-create with developers and researchers, Almirall and Wareham (2008) argue that: *´Living labs are the first attempt to structure and provide governance to user involvement in a way that can be addressed by companies, research institutions, public organizations and policy makers´*.

However, when discussing the innovation intermediaries, it is important to understand the basic difference between open innovation and living lab. Compared to open innovation intermediaries described by Chesbrough (2006) and Dodgson et al. (2006), living labs have different participant stakeholders. In Chesbrough´s (2006) and Dodgson et al.´s (2006) studies, open innovation actors are mainly private firms operating largely globally or research institutions. Instead, living labs are commonly Public-Private-Partnerships (PPP) committed to communities that contribute to their funding. They provide a wide range of services and play diverse role in user involvement, from support to entrepreneurial lead users to needs-finding or user experience services. Living lab´s goal is the creation of ´innovation arenas´ where various actors could experiment in an open, real-life environment. Therefore Almirall & Wareham (2008) argue that it is a difficult to imagine a better place for open innovation when looking at the goal of living lab. (Almirall & Wareham, 2008)

As stated earlier in the Literature Review, innovation process and open innovation has different actors and intermediaries (see e.g. Chesbrough, 2006). The main actors are companies and research institutions. Living lab´s roots are mostly in universities or innovation city promotion centers. Hence, living lab plays a role of intermediary. According to Almirall and Wareham (2008), this role has several activities:

- Broker or agent between companies and research centers
- Connector, facilitating networking between actors
- Knowledge broker, applying ideas or technologies to different contexts
- Coordinator, setting up projects and providing technological, project management and administrative support

These activities are same or similar as presented earlier in the previous innovation research (Chesbrough, 2006). However, living lab emphasizes a new actor in the innovation process: users. Almirall and Wareham (2008) have found three new activities that living lab performs:

1. Living lab provides services around user experience
2. Living lab supports lead users
3. Living lab creates societal involvement

These activities aim to provide structure and governance to user participation. As stated in earlier Chapter, user participation has been considered from the perspective of individual user involvement (see e.g. von Hippel, 1988, 2005 and Chesbrough 2003, 2006) therefore lacking structure and governance issues. However, according to Almirall & Wareham (2008) living labs aim to provide structure and governance to the user participation. They can do it by performing the three activities stated above: providing services around user experience, supporting lead users and creating societal involvement, and also maintaining user groups. (Almirall & Wareham, 2008)

Living labs maintain user groups by organizing user involvement in the innovation process. For that purpose living labs can use several methods: providing cohesion, offering support, developing competences and technological platforms,

conceiving/participating in user-centered projects and promoting user participation through feedback and reputation mechanisms. (Almirall & Wareham, 2008)

Living labs provide services around user experience and involvement to companies in the context of projects, aiming to obtain products that relate better to users´ needs, concept validation of to capture new ideas that could improve a product or a service. In addition, living labs support lead users as entrepreneurs providing networking, technical expertise, project management and sometimes funding. (Almirall & Wareham, 2008)

Living labs pursue to increase innovative capacity by promoting user and societal involvement. This happens already intrinsically because their exploration is situated in real-life environments. Perception of being innovative and the reputation influence living lab´s capacity to attract users (innovators). Also the overall perception, the level of dissemination and the public acceptance of results have role in the formation of innovative capacity. In addition, users want reward for their contribution. Usually gaining reputation and a sense of belonging and participating in new and relevant experiments are the most important rewards, not money.

However, even though it seems that open innovation plays an important role in the living lab concept, there are also other opinions. Eskelinen (2011) reminds that user-centric innovation and open innovation are different cases. However, it is quite common to try to ´squeeze´ both of them into the living lab model. Sometimes this is done successfully, sometimes not. According to Eskelinen (2011):

> *´A good living lab does not have to use the techniques of open innovation. Open innovation means only the change of ideas within different organizations. Type of information defines whether or not the users are involved in open innovation. Similarly, a company can drive user-driven activities according to living lab concept independently or with partners without the information gained from living lab would be available to everyone as the open innovation paradigm suggests.´*

3.1.3 Characteristics

There is a wide-ranging field and descriptions of living labs. However, according to Følstad (2008) there are some common perspectives to characterize living lab in general. These perspectives can be found especially in organization´s innovation and development process where living lab contributes in many ways. Especially in the discovery and evaluation phase living lab has strong contribution. However, living lab also contributes to the other stages of innovation and development as well: context research, co-creation and testing. (Følstad, 2008)

The context research means to investigate the context of use, including the users and their environment. The use of ethnographic methods is typical in this process. In discovery phase, living lab offers insight into unexpected uses and new service opportunities Følstad (2008). Therefore, living lab helps to uncover totally new issues and opportunities (Abowd, 2000). By using living lab approach, developers and service providers can find out how new solutions work among their users and how to find inspiration for future innovation. (Følstad ,2008)

Living lab brings different stakeholders together in a co-creative way. In living lab, users have an important role in developing new products and services with developers (Ballon et al., 2005; Følstad, 2008). Co-creation is implemented in different ways in living labs. Ballon et al. (2005) emphasizes the importance of user feedback based on users´ experiences of new product or service in real-world contexts. Hoving (2003) accentuates a series of action-research interventions, where end-users are provided with new solution and researchers are monitoring the effects of the interventions.

One of the living lab´s main purposes is to evaluate or validate new solutions with users. This can be happen either in the early design and prototype phase or in the later phase validation activities with users. The user feedback is typically returned to the development process Følstad (2008) De Leon et al. (2006) present living lab as open innovation platform allowing new services and products to be *"created and validated in collaborative […] real-world environments within individual regions"*

The other way to characterize the living lab is to analyze the context of the living lab. The context means the arena for user interaction with the new ideas under development. Usually new ideas are tested in contexts familiar to the users. (Følstad, 2008) This can be for example an authentic home setting (Kidd et al., 1999) or a regular grocery store (Orava, 2009). However, familiar contexts are not necessary same as the real-world contexts. Familiar contexts can be either real-world contexts or simulations. The latter means a context which has been constructed and used particularly for a certain research purpose. (Følstad, 2008) The context can vary by size a lot. It can be from relatively small-scale and geographically limited, for example electronic classrooms at university, to a large-scale living lab covering whole geographical regions, for example the Digital Madeira Test Bed and Living Lab. (Oliveira, 2006)

3.1.4 Processes

Living lab processes are linked to organization´s innovation and development processes. Pierson and Lievens (2005) describe living lab´s research cycle as a four-phase process. The process includes contextualization, concretization, implementation and feedback. Contextualization refers to explorations regarding relevant technologies and respondents. Concretization includes baseline measurements and respondent profiling. Implementation means provision of new technology to end-users, and feedback refers to ex-post-hoc measurements and inferences of technology recommendations. (Pierson & Lievens (2005)

McNeese (2004) also describes a four-phase process: ethnographic study, knowledge elicitation, scaled worlds and reconfigurable prototypes. Ethnographic study refers to ethnographic analysis of system and work context based on observation. Knowledge elicitation denotes tool-based identification of relevant cognitive factors, such as goals, schemas, strategies and beliefs. Scaled worlds adverts to high-fidelity simulations of real-world contexts, and reconfigurable prototypes indicates evolving prototypes implemented in a scaled world. (McNeese, 2004)

Even though Pierson and Lievens (2005) and McNeese (2004) describe different processes they have a number of similarities in their model. First, the context of use is researched thoroughly. Second, new ideas are implemented in contexts which are familiar to participants. Third, feedback from the participants is used for improvements of the tested idea. Fourth, both of them use an ethnographic study. (Følstad, 2008)

Mirijamdotter et al. (2006) have a slightly different approach which is similar to user-center design process. They call their process as ´appreciating needs´ which refers to stages of discovery, co-creation and evaluation in the innovation and development process. Their process has three phases: discovery and dream, design and develop, and destiny and disseminate. Discovery and dream refers to eliciting and prioritizing needs. Design and develop is prototype development, and destiny and disseminate means prototype testing and evaluation. (Mirijamdotter et al., 2006)

3.1.5 Methods

Living lab concept has several methods which may be used as elements in living lab innovation and development processes. The most common method is the use of ethnographic research methods (Følstad, 2008). Ethnography engages in ´participant observation´, which means that the researcher participates as much as possible in local daily life. Data collection is inductive, interactive and recursive in nature. In addition, the data collection can be either unstructured or structured. The unstructured data collection includes observation and social mapping, key informant interviews and participant observation. Structured or semi-structured data collection includes interviews and observation. (Vuorinen, 2005)

The second common method is different questionnaires. They are used mainly because they enable data to be gathered from a large number of respondents at low cost. This is especially suitable for living labs which involve large numbers of participants. The use of focus groups is also a common method. (Følstad, 2008) Focus group is a research method in which a group of people are asked about their perceptions, opinions, beliefs,

and attitudes towards a product, service, concept, or idea. Questions are asked in an interactive group setting where participants are free to talk with other group members. The strength of the focus group is that it can provide qualitative in-depth information on a topic relevant to the participants. (Parviainen, 2005)

Eskelinen (2011) emphasizes methods of user-centric design. These methods are ethnographic research, other anthropological methods, co-creation methods, lead users and user communities. Anthropological methods examine the origin and effects of phenomenon. These are for example, participant observation, cross-cultural comparison, survey research, interviews and historical analysis. Co-creation methods are for example face-to-face group studies, such as focus groups. In addition, crowd sourcing is a common method of co-creation. It is more anonymous than focus groups but it allows more participants. Usually it is issue or solution based, and it exploits social media tools. Lead users were introduced by von Hippel (1986) in the earlier Chapter.

3.1.6 Key Considerations

Even though living lab has many advantages it is not always the best approach in developing product or service. Eskelinen (2011) argues that living lab is not appropriate to use in product or service development when only small changes are possible to perform. In addition, if the business model is already strictly decided, it is not rational to waste resources to comprehensive user studies. In that case, for example focus group studies or scenario work would be more appropriate. Eskelinen emphasizes that using lead users in product or service development does not automatically means living lab. However, many companies are doing so, according to Eskelinen. User involvement should contain also a real environment, such as urban environment. (Eskelinen, 2011)

Nonetheless, according to Eskelinen (2011) there is an optimum case for living lab. If the developer can really answer positively to question, does the product or service have a place for users´ everyday life, then it is worthwhile to test it in users´ everyday life, in

the living lab. In addition, living lab can also be part of marketing if the company wants to commit the users. (Eskelinen, 2011)

The core in building of living lab is to ensure that the operating situation is genuine. Eskelinen (2011) accentuates that this is the only way to get an answer does the living lab work or not. The second key point is the user involvement. It should be designed align with the goals of living lab to confirm the living lab is testing what it should and the results of living labs are appropriate. In addition, user involvement should be an iterative process: the tested idea is being developed constantly among different stakeholders, including users. Living lab actors should also be adjusted the degree of participation and interaction with users. The lightest version is an observation of users. In that case, users do not have to take effort. Other method is using of different questionnaires which can vary by the amount of effort needed. The heaviest version for users is to use lead users (see e.g. von Hippel 1986) who are very motivated, committed and better than organization´s own developers. However, lead users are not appropriate testers if the tested idea is something that is not interesting. Therefore, the tested idea should be something unique or something that really add value to the users. Eskelinen (2011) reminds that organization should understand that usually users are not interested in using the product or service but he/she is forced to use it. Therefore, organization is usually the one who is more interested in the new product or service. Furthermore, the amount of different users varies too. Usually there are only few lead users but on the other hand it is possible to have thousands of users in online. (Eskelinen, 2011)

Other way to analyze the user involvement is to use a framework developed by Copenhagen Living Lab. The framework illustrates different interaction methods with customers in living lab. The right method depends on two factors: is the customer already known or not, and does the organization wants to be in direct or indirect contact with the customer. The framework offers four interactive methods: marketing, master users (lead users), ethnography and participative design. Marketing means normal marketing activities which companies are performing. In that case company at least

think it knows the customers even though it is only in indirect interaction with them. However, marketing is not a typical method of living lab as the three other methods are.

Master users, or lead users as von Hippel (1986) calls it, is a method to be in direct interaction with already known customers. For example, a Finnish retail company Kesko has used master users in its living lab in Helsinki to improve customer experience (Tuomi, 2009).

Ethnography is an appropriate method when customers are not known and the interaction is indirect. Participative design is vice versa. It is used when customers are known and the interaction with them is direct. Participative design requires customers who are interested in designing (developing) product or service. In that case, the motivation of users is critical. Living lab should be able to motivate users to be active developers. The motivation of users is an essential part of living lab´s success. Hence, rewards, including money and the feeling of being part of something new and important, are important factors in the success of living lab. However, rewards can be controversial. Sometimes rewards can lead to a more positive outcome than without the rewards because users are sometimes feeling that they have a responsibility to give positive feedback. The Figure 15 presents the different interaction methods with customers in living lab.

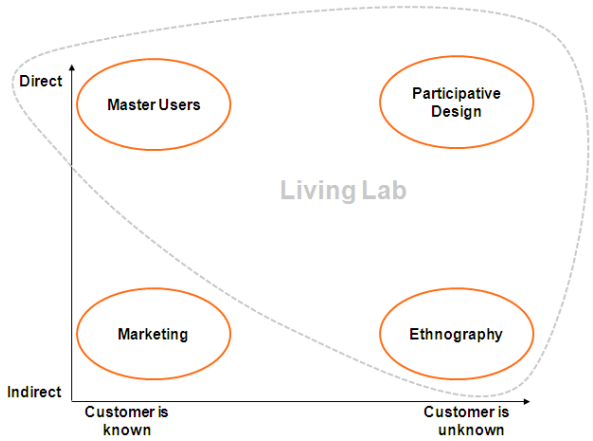

Figure 15: Different Interaction Methods with Customer in Living Lab (adapted from Copenhagen Living Lab & Eskelinen, 2011)

The establishment of living lab has also several key considerations. According to Eskelinen (2011) it is vital to have appropriate and genuine motives towards living lab. For example, if an organization knows that industry is changing because of users´ different needs or expectations, but the organization itself does not know what those needs or expectations are, it is worthwhile to establish a living lab. According to Eskelinen (2011): *´With living lab an organization takes a giant leap forward to an environment where it can test safely new products and services which add value to customers and meet customers´ needs and expectations.´*

Eskelinen (2011) also punctuates the important of benchmarking. It is a cheap but an effective way to exploit best practices and lessons learned from other living labs. Hence, the next section presents a brief benchmarking study. Also a networking could be a good idea to ensure that the organization has right capabilities to establish and operate living lab. As open innovation declaims, you do not have to do everything by yourself, especially if you do not have the right capabilities or ideas. Furthermore, the ownership of living lab should be clear. The owner can be a single person or a group of people. But the most important is to find the owner who is committed, motivated, and who feels this is important. (Eskelinen, 2011)

Even though living lab´s aim is to develop better product or services with users, it is important to have clear focus. Living lab is not the best place to test everything. There should be a clear operating model and decision points and other metrics to assist the organization to make the decision which of the idea goes to living lab and which one goes to normal R&D process or failures. Eskelinen underlines: *´Keep it simple!´* and also emphasizes:

> *´Our success has been the fact that we have given up thinking innovation communities and living labs as unrelated subjects. Both of them are tools which we are using in our initiatives. Living lab does not have an absolute value. It has an instrumental value.´*

According to Eskelinen (2011) the use of external resources are crucial in living lab. He argues that there is no sense to establish and operate living lab alone. Especially

methodological issues are better tackle with professionals. Only a few companies alone have capabilities and experience in co-creation, data mining, observation, fast prototyping and facilitation. Therefore, it is better to use external resources in the areas where the company itself does not have the best expertise. This is same what open innovation paradigm emphasizes. Of course it is naturally possible that especially a large organization can acquire the expertise outside of the organization to establish in-house practice. However, Eskelinen argues that in that case the neutrality and objectivity might reduce than in the case of external experts.

The following Table 8 summarizes the living lab section.

Definition	User Involvement	Real-Life Context	Actors/ Stakeholders
User-centric, open innovation ecosystem in a real-life environment	Active user involvement and empowerment in development and validation of ideas	Environment that is familiar to users from their daily routines, e.g. house, grocery store	Various, depends on living lab, e.g. public (city, state), private (company), people (users, personnel)

Processes	Methods	Key Considerations	Representative Research Areas	Representative Living Lab Studies
Linked to organization´s innovation and development processes	Ethnography, questionnaires, focus groups, lead users, communities	Genuine need and motives, user involvement, selection of right methods, exploiting best practices and lessons learned, clear operating model and ownership, use of external resources	User-centric innovation (von Hippel, 1988, 2005), open innovation (Chesbrough, 2003, 2006)	Ballon et. al (2005), Følstad (2008), Almirall & Wareham (2008)

Table 8: Summary of Living Lab Section

3.2 Benchmarking Study of Living Labs

This section provides a brief benchmarking study of different living labs from various countries and industries. However, some of the examples have been excluded on this version of the study. First, The European Network of Living Labs (ENoLL) will be presented to provide a broader understanding of existing living lab and their purposes from European and global perspective. Then, living labs in Finland will be covered to understand better the existing context for case company´s Living Lab.

3.2.1 European Network of Living Labs

The European Network of Living Labs (ENoLL) is an international federation of benchmarked living labs in Europe and worldwide. It was founded in November 2006 under the auspices of the Finnish European Presidency. Currently ENoLL has 236 European Union (EU) living labs and 38 outside EU, for example in Brazil and China (Oliveira, 2011). The ENoLL is both an open community and a legal international non-profit association which is headquartered in Brussels. Its main objectives are to enhance innovation on a systematic basis and to contribute to the creation of a dynamic European Innovation System. The policy is supported by the European Commission and EU Presidencies and is in line with the EU´s growth strategy Europe 2020, which for example aims to increase investments in R&D/innovation, and with the Europe Digital Agenda, which aims to deliver sustainable economic and social benefits from a digital single market based on fast internet and interoperable applications. ENoLL aims to support co-creative, human-centric and user-driven research, development and innovation in order to better cater for people's needs. (ENoLL, 2012)

ENoLL offers versatile services to its members from networking activities and information flow among the members to project development services and exploitation of best practices to develop and operate living lab. An organization which has activities and interests in user-centric open innovation can become an ENoLL member either

joining the open community for free or joining the association of fee-paying members. (ENoLL, 2012)

ENoLL is the major player, at least in Europe, in the field of living labs. It has established thematic sub networks of living labs in a broad area, such as energy efficiency, well-being and health, smart cities, social innovation, e-Government and security. ENoLL has also supported local, national, regional and cross-border networks of living labs in Europe. The most active and largest networks are in Finland, Sweden, Spain and Portugal. Furthermore, ENoLL has expanded its network outside of Europe to Brazil, Africa, the USA and even to China. (Oliveira, 2010)

For example in Brazil ENoLL has been active player in recent years. The background of the expansion to Brazil is in the broader agenda between the EU and Brazil´s government. Brazil is a strategic partner of the EU and therefore there are different initiatives across the sea. Besides, Brazil is one of the fastest growing economies, has huge market opportunities, and it is driving the socio-economic growth by strong political support to innovation. (Oliveira, 2011)

In Brazil ENoLL has promoted awareness and motivated Brazilian stakeholders to the living lab methodology. ENoLL has succeeded in to create several living labs which have different goals. For example, Cidadania Living Lab is focusing on digital citizenship, Amazonia Living Lab is driven by nature innovation, and Rio de Janeiro Living Lab is driven by Olympics spirit and well-being. (Oliveira, 2011)

Cidadania´s Digital Citizenship Living Lab is located mainly in residential areas of lower income where citizens are facing more serious socio-economic problems. Living lab´s purpose is to provide user-driven services addressing the social needs of all ages of the digitally divided population. Services and methodologies are developed to overcome the socio-economic disadvantage by providing access to the information that directly affects them, such as health, education and employment. Citizens (and doctors) can easily see, for example their basic medical information, such as blood pressure and hemoglobin to see if they need to react.

Overall, Cidadania Living Lab has developed and refined methodologies, tools and process for the development of innovative pilot projects, which are user-driven to address specific needs of the communities; facilitation of the co-creative process to find totally new initiatives; co-designing new contents; social fieldwork closely with ICT services to prepare, operate and monitor results; and organization of public events, seminars and workshops to promote the living lab activities.

ENoLL´s current Chairman is Álvaro de Oliveira who has academic experience in the University College London where he got his Ph.D. He has also worked in ICT engineering and manufacturing company, and currently he is a visiting Professor at the University of Helsinki, involved in open innovation policies and methodologies, including Living Lab. (European Commission, 2012) The Vice Chairman of ENoLL is Jarmo Eskelinen, who is also a CEO of Forum Virium Helsinki, which develops new digital services in collaboration with companies, the City of Helsinki and other public sector organizations. He was interviewed for this study.

Living lab ecosystem from the ENoLL perspective has many stakeholders with different roles. Living lab itself acts as a central player which facilitates and coordinates operations. This is built on the charisma, trust and emotions which the living lab has or presents to other stakeholders. The living lab´s charisma shows how capable it is to facilitate the operations and thus achieve common goals. Mutual trust and transparency is the key element between the stakeholders. In addition, there might be some emotions that drive operational activities. (Oliveira, 2010)

All the living labs in the ENoLL have one common characteristic: involving users in the innovation process through real-life experimentation. Most of them are Public-Private-Partnership coming from either academia, as an evolution of the technology transfer units in universities, or city innovation promotion agencies. Therefore, living labs are relatively small organizations. However, they play important coordination roles between academia, companies, public agencies and users, while providing a series of services

either directly or through close partnership with other companies. (Almirall & Wareham, 2008)

RDI stakeholders illustrate the European Commission´s PPPP principle: Public-Private-People Partnerships for user-driven open innovation. RDI stakeholders consist of public administration (EU), universities and research organizations, enterprises and funding and financing stakeholders. Their purpose is to drive co-creation, new business models and social innovation. Their operations are based on shared leadership and true collaboration. (Oliveira, 2010)

The third part of the living lab ecosystem is user communities which are either real or virtual. Users have strong role in living lab ecosystem. User involvement helps to discover what users really want and need, and even their unexpressed needs. Testing ideas, services, concepts and products with users help to develop them even better. Furthermore, early adopters promote to speed up the acceptance by the users. In that case, users do the selling to other users which is more effective than if the company does it. The Figure 16 below shows typical living lab ecosystem. (Oliveira, 2010)

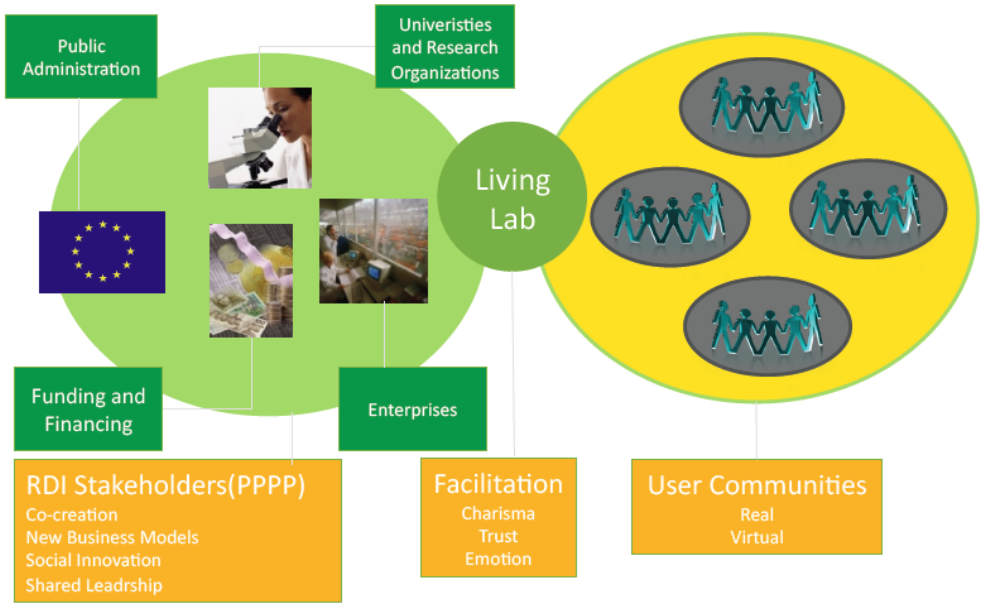

Figure 16: Living Lab Ecosystem (Oliveira, 2010)

However, ENoLL has also been criticized. According to Eskelinen (2011), even though ENoLL´s current situation is good and it is popular organization, it could have less and more active members, and operate more efficiently and professional.

ENoLL´s example shows how widely the living lab concept has expanded both in geographically and in different themes. ENoLL´s living labs are used to solve mainly major socio-economic issues, such as energy and environment, well-being, e-health, media and creativity and logistics challenges, which cities, governments, public organizations and enterprises are facing. ENoLL also has an important role in EU´s strategic initiatives as the Europe 2020 strategy and the Digital Agenda indicate.

3.2.2 Living Labs in Finland

This subsection provides a brief description of living lab activities in Finland where the case organization locates. According to Eskelinen (2011) there have been three phases: rise, destruction and new rise of living labs. This study contributes to the new rise of living labs.

Living labs came ashore to Finland in the beginning of 2000s when The University of Art & Design Helsinki (UIAH, current Aalto University) Professor Jarmo Suominen introduced the concept. He had worked previously at the MIT Media Lab where the concept of living lab was established. (Suominen, 2002) The original idea of living lab was soon modified to mean user-centric RDI activities in different real-life environments, not only in the housing (Orava, 2009).

First living labs in Finland focused on development of city services (Eskelinen, 2011). For example City of Helsinki was among the first actors. Soon academic and research world started to pay more attention to this new phenomenon. Universities in Helsinki area: Helsinki University of Technology (HUT), UIAH and Helsinki School of Economics (HSE), which all form the current Aalto University, as well as Technical Research Center of Finland (VTT) were among the first actors. They studied

technology, usability, design, behavioral models and business models of living labs. (Suominen, 2002) Also the EU and other public governmental organizations launched couple of EU driven programs mainly in the area of city, social, and energy development, which increased the popularity of living labs (Eskelinen, 2011).

At the same time von Hippel´s (1988, 2005) studies on user-centric innovation became popular, as well as Chesbrough´s (2003) studies on open innovation, which expand the living lab phenomenon. However, the economic crisis which started in 2008 changed the situation. The popularity and hype around living lab decreased in Finland. Also the living lab activities were dispersed through lack of coordination. (Eskelinen, 2011)

However, despite the challenges in the living lab environment in Finland, there are still many active living labs. They represent various industries, and they operate through various actors for public, academic and commercial use. They are mainly regional or thematic living labs in Helsinki metropolitan area in areas, such as smarter city development and city services development (e.g. healthcare). Furthermore, there are tens of organizations which are somehow part in living lab activities, such as research institutions, universities, cities and companies. ENoLL and Helsinki Living Lab that operates in Helsinki metropolitan area have been the most known and wide-spread networks. (Orava, 2009) However, the operation has not been very professional and it has been widely criticized (Eskelinen, 2011).

According to Eskelinen (2011), today there is not a clear and functional living lab network in Finland. Furthermore, no one has a clear picture of Finnish living labs and their activities. (Orava, 2009) However, Finnish Ministry of Employment and the Economy, and Tekes (the Finnish Funding Agency for Technology and Innovation) have started a three-year program in November 2011 which aims to develop living lab for national success factor (Tekes, 2011). According to Tekes (2011) the purpose of the program is to strengthen Finnish living lab activity and its development through activating firms and other actors (research institutions, public sector, third sector), and

also improving and facilitating networking. It will be interesting to see how this program succeeds.

However, nowadays there has been increasing popularity among enterprises to use living labs for their commercial purposes (Eskelinen, 2011). Helsinki Living Lab has been active in that field. For example a retail giant Kesko Food (Ruokakesko) and mobile operator Saunalahti have used Helsinki Living Lab. Kesko Food has examined the future of retail business through living lab. Saunalahti has tested different products and services in different product lifecycles. This has been mainly fast prototyping research. (Eskelinen, 2011)

In the joint project between Helsinki Living Lab and Kesko Food, the purpose was to increase Kesko Food´s understanding of its different customer segments and their daily needs, routines, habits, and processes to do daily groceries and the reasons behind that activity. The project was part of Kesko Food´s larger initiative of online customer communication which aimed to increase the retail business more towards online. Also Tekes and Laurea University of Applied Sciences were partners of the project which was in 2009. Laurea was responsible for conducting user studies for different customer segments. (Tuomi, 2009)

First, the project examined what kind of products and services Kesko Food had. Then the focus was on studying how ´master users´ (customers) behave in current user environment: in a grocery store. The ´master users´ were normal customers in the district of Arabianranta in Helsinki. User studies and ´food diaries´ held by users formed the primary data. For example, food diaries included information on how users are planning what they are going to eat, buying groceries, and finally preparing the meal, and also analyzing Kesko Food´s current services to perform these tasks. Kesko Food used the gained user information to develop new ideas and solutions for customers´ problems. As a result of the project, Kesko Food gained lots of user information from its customers to develop its services to better meet customers´ needs. Kesko Food also gained information on online retail store of the future. (Tuomi, 2009)

4 METHODOLOGY

In this chapter the research methodology is described in more detail and the choices are explained. First, the research process presents the design of the research. Second section is devoted to data collection. Third section focuses on data analysis. Fourth section includes the evaluation of the empirical study.

4.1 Research Process

This thesis is part of the case company´s ´innovation agenda´ which aims to develop the innovativeness of the case company. The researcher was part of one of the subprojects of innovation agenda. This subproject was jointly done between the case company and IBM where the researcher works. The subproject identified Living Lab as one of the key innovation programs – the focus area of this study.

This thesis increases the knowledge of case company´s Living Lab by researching the purposes of it, as well as the origin of Living Lab. Furthermore, the integration with strategy and innovation agenda, including new product development and open innovation activities are covered. Hence, this study provides managerial implications for the case company on how to develop Living Lab further before its launch, and how to drive growth through collaborative innovation.

The specific subject for the research was chosen because living lab is an area that has not been researched much previously, and particularly not in this kind of context: service industry, and integration to strategy and broader innovation context. This means that the thesis can provide an interesting and valuable contribution to the research fields of living lab, innovation and strategy. Furthermore, previous studies (see e.g. Almirall & Wareham, 2008) have mentioned the area of how living lab is linked with innovation management initiatives and in companies as an important topic to be investigated further. Thirdly, this study provides managerial implications for the case company on what are the key areas to cover in further development of Living Lab, how to integrate Living Lab into existing innovation development process, and what is the role of Living

Lab in the context of strategy. Another reason supporting the choice of the particular research focus was its fit with the situation and innovation agenda of the case company. The thesis helps the case company to become more innovative company. This is crucial because innovation is the most important area to make fundamental changes in the business world, where the competition is fierce, customer expectations are escalating and market shifts are unexpected (IBM, 2011).

The research was conducted as a qualitative single case study. It is the most suitable approach for finding answers to the research questions posed above. According to Koskinen et. al. (2005), qualitative method is a valid method when the research attempts to answer questions, such as how and why. Eriksson & Kovalainen (2008) emphasize also that when in-depth information and understanding are needed, case study is a proper way to conduct a research. Furthermore, according to Yin (2009) the case study method investigates a contemporary phenomenon in depth and in the real-life context where the boundaries between the phenomenon and context are not clearly visible.

A single case study was chosen because it allows investigating one case – Living Lab – on a deeper level. Furthermore, Living Lab is a unique case in case company´s industry in Finland, and therefore revealing case of that phenomenon. However, the study includes a benchmarking study of selected existing living labs from various industries, to provide best practices for further development of Living Lab. In a living lab context it is a common method to use the shared knowledge and best practices. Furthermore, Yin (2009) states that: *´Even if you can study only a ´´two-case´´ case study, your chances of doing a good case design will be better than doing a single case and the external generalizations of the findings will be increased´*. However, the primary focus is on Living Lab. Other living labs provides only insight and best practices, and they also help to understand why the case company started the Living Lab initiative and how it has been developed.

The study used a triangulated research strategy which is commonly used in case study approach (Koskinen et al., 2005). Triangulation means the protocols that are used to

ensure accuracy and alternative explanations (Koskinen et al., 2005). This study uses the triangulation of data, methods and theories in order to understand the complex phenomenon as well as to increase the quality of the study. The data was collected during the study by thematic interviews, organizing a workshop, observation and using other documents as secondary material.

The role of theory in designing the study is deductive: scientific reasoning from general to specific, developing propositions from current theory and testing them in real world. According to Eisenhardt and Graebner (2007) case study´s purpose is to develop a theory which requires a strong grounding in existing literature. The existing theory of strategy and innovation provides a starting point for empirical analysis and a synthesis of the theoretical framework in general. It also helps to understand the research phenomenon better.

4.2 Data Collection

The main data collection method used in this study was thematic interviews. However, there are lots of other data sources, including workshop, observation, and documents provided by the case firm. The reason to choose several data sources is the emergent nature of the researched phenomenon – Living Lab. It has not yet launched, instead it is still under the development. Therefore, it is better to have as much data available as possible to better understand and analyze the phenomenon.

The data of this research divides into two categories: field notes and texts. Field notes include thematic interviews and observation field notes. Texts include case company and IBM archives – especially materials relating to innovation and strategy issues. Previous research and theories on strategy and innovation are used as background material to improve the interpreting of the empirical data.

Thematic interviews are the most used method of gathering qualitative data in economics research (Koskinen et al. 2005). Thematic interviews are based on an

interview template that the researcher prepares beforehand. The template includes a few themes that will be gone through in each of the individual interviews. However, the template is not strictly binding. Instead, the questions do not have to be answered in the same order, and the interviewer may formulate questions freely under each theme in each interview, and the interviewees can answer in their own words and bring up additional issues in the conversation about theme in question. The interviewer uses the template to make sure that all the themes are gone through with each of the interviewees, and that the main questions will be asked. Although the interview is somewhat conversation-like, it is the responsibility of the interviewer to make sure that the discussion revolves around issues that are relevant for the research. (Koskinen et al. 2005)

Thematic interviews were chosen method because it allows the people in the organization to talk rather freely and bring up issues by themselves. Hence, the important factors could come up from interviewees not from interviewer. Therefore, thematic interviews enable to build a deeper understanding of the research problem.

The choice of interviewees in qualitative research is one of the most critical issues. The researcher should bear in mind the research objectives when considering the appropriate interviewees. (Koskinen et al. 2005) The selection of interviewees was done partly together with the case company. However, the ten interviewees or their positions in the case company cannot be revealed. Furthermore, there was a living lab expert, who was the vice president of ENoLL (European Networks of Living Lab). There was an own interview template for him which focused on getting living lab insight and data for further development. Both interview templates with list of themes and the key questions can be found in the end of this thesis as appendixes.

However, there were also orientating interviews which were part of the subproject of IBM and the case company. They provided background information to widen the understanding of the case company in the context of innovation and strategy.

The interview templates were prepared after carefully studying existing literature on the subject to ensure a relevant set of questions. Furthermore, the orientating interviews and the results of workshop where used in formulating the templates. The questions were formulated freely in a conversational manner in the interview situation. Furthermore, the interviewer let space for interviewees to talk freely, but also ensured that the key areas were covered and the interview was progressing in an appropriate way. The interviews were performed between November 2011 and February 2012. The duration of the interviews varied from one hour to approximately two hours.

The second source of field notes was observation through participation in different internal meetings of the case company, and organizing a workshop. The researcher participated in several meetings in summer 2011 that covered the development of Living Lab. This enabled to get a broader view of the research phenomenon, and also form more appropriate interview questions for the interviews. Furthermore, the interviewer organized a workshop in September 2011 through IBM for the case company to develop the concept further.

Workshop, sometimes called as focus group, was selected to one of the sources of data for many reasons. First, workshop can be used for ideation or further development of the concept. Second, workshop is an effective method to gather good quality information that can contribute to improved outcomes. (Parviainen, 2005) Third, the case company wanted to have it to get better understanding of living lab concept.

The following Figure 17 presents the research process of this study.

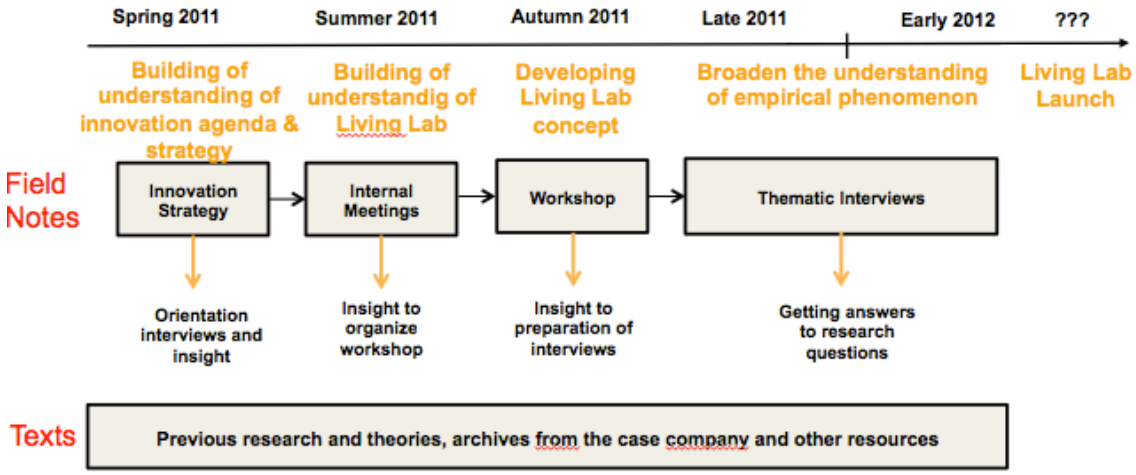

Figure 17: Research Process

4.3 Data Analysis

According to Partington (2002) there are four dimensions that should be taken into account when starting data analysis: purpose of the research, research question, theoretical perspective and research design. All of these issues are remembered.

The data has been analyzed carefully. In order to do so, the data management has been done properly. Therefore all of the interviews were recorded and typed up into accurate, word-to-word replications of the interview transcripts. This has ensured that important information has not lost. After this the transcripts and observation notes were organized into different documents according to the main themes that are from the research questions. These themes from the case company perspective are: company and business environment, strategy, background of innovation, objectives of innovation, innovation stakeholders, living lab, and development ideas. These results and analysis are presented in tandem in Chapter 5. Furthermore, the expert interview focused on the following themes: background of living lab concept, definition and purposes of living lab, ideal model of living lab, living lab´s business focus, and the relationship between living lab and innovation. These results are presented in next chapter in tandem with earlier research on living lab to address the lack of existing living lab studies.

Attaching meaningful code labels to set of field observations, interviews, company reports, and other notes has been conducted. Also identifying of similar phrases, words, patterns, themes, relationships and differences has been done. Furthermore, careful comparison has been done to find out the best practices for managerial recommendations for Living Lab.

Field notes were processed in an iterative manner so that the key findings became clear. Hence, different kinds of notes, bullet-point lists, tables, and figures were used to support the process of analyzing and structuring the key findings – the most relevant ones are also presented in this study. Hence, the method chosen to analyze the data was analytic induction. According to Koskinen et al. (2005), analytic induction is a very common method in qualitative research, and it consists of first analyzing a small group of instances to formulate an initial conclusion, and then testing it against larger amount of data. After that the conclusion will be refined in the process so that in the end it can be said to represent the entirety of the data (Koskinen et al. 2005)

4.4 Evaluating the Quality of the Study

Conducting totally neutral research is not possible because researcher´s own values, assumptions and ethics inevitably influence at some level. However, Denzin and Lincoln (2003) point out that a researcher has to believe that he can with objectivity, clarity and precision report on his own observations of the social world including the experiences of others.

Relevant questions in the quality of qualitative research are to consider how well the arguments, interpretations or conclusions in the research actually represent the object that are supported to represent. This refers to the validity of the research. Another relevant question concerns the question of how the research provides credible results and would similar results be achieved if the study was repeated. This refers to the reliability of the study: its credibility and repeatability. (Koskinen et al., 2005)

There are several ways to measure the quality of the study. The positivist paradigm argues that there is nothing specific in the qualitative research. Hence, it can be evaluated as quantitative research by using four criteria that are: internal validity, external validity, reliability and objectivity (Lincoln & Guba, 1985; Denzin & Lincoln, 2003). Furthermore, Lincoln and Guba (1985) present four criteria in assessing the quality of the study: credibility, transferability, dependability and conformability. Wallendorf and Belk (1989) added a fifth criterion that is called integrity. These five criteria are used in the following discussion of the quality of the study.

Credibility (internal validity) refers to the extent to which the results are acceptable representations of the data (Lincoln & Guba, 1985). This study has achieved credibility through transparency of the research process, triangulation of data and methods, careful data analysis, and presenting findings continuously to the case company. Furthermore, considerable amount of quotations were included in the study to give the reader the possibility to assess the validity of interpretations and estimate the quality of conclusions.

Transferability (external validity) is the extent to which findings of the study in one context are also applicable in other contexts (Lincoln & Guba, 1985). In other words, this means the degree to which research findings can be applied to real, external world. In this study multiple methods, purposive sampling and careful documentation of procedures increase the transferability. However, the limited amount of interviewees brings some limitations in the richness of the data, as well as the single case method. This inevitably has an effect on the validity and generalizability (external validity) of the results. However, the data provides an interesting first insight into studying living lab approach in service industry and in the context of broader setting of strategy and innovation.

Dependability (reliability) is the extent to which interpretation was constructed in a way that avoids instability other than the inherent instability of a social phenomenon (Lincoln & Guba, 1985). In other words, dependability is the extent to which findings

would be repeated if the study is replicated. In this study the dependability is achieved through giving a detailed description of how the study is conducted, including the interview guides and questions, as well as a detailed research process (see Figure 18). Furthermore, the interviews were recorded, transcribed and analyzed carefully. The interviews were in Finnish, which was the original language of the interviewees. However, the selected comments that appear in Chapter 5 were translated into English after the analysis and selection of commentaries to be shown in the study were made. Hence, the data analysis was made when the data still had all the subtle tones which may get lost in translation from Finnish to English.

The earlier connection with the case company may have affected the quality of the study. However, the researcher was aware of the need to remain neutral when conducting the study. Furthermore interactive study and good relationships with the representatives of case company gave excellent possibilities for flexible and exhaustive data collection. Also all the interviewees were conducted by the same interviewer so there was no variation in the interviewing style that might have caused different results.

Conformability (objectivity) refers to the extent to which interpretations are the results of the participants and the phenomenon as opposed to the bias caused by the researcher (Lincoln & Guba, 1985). In this study the conformability rests on the credibility of the empirical data, analysis and the reporting. During the research process, the findings were presented and discussed with the case company constantly.

Integrity refers to extent to which the interpretation was unimpaired by lies, evasions, misinformation or misrepresentations by informants (Wallendorf & Belk, 1989). To prevent the issues of integrity, the purpose of the study was told to all interviewees. Furthermore, all the interviewees were encouraged to ask any questions concerning the research during the research process, not just in the interview situation. The researcher also asked for a permission to record the interviews. Furthermore, the atmosphere of trust was created with a regular contact with the case company.

5 CASE COMPANY´S LIVING LAB

This chapter presents the main empirical findings of the study: case company´s Living Lab. First, the operating environment of the case company is presented. Second, the overview of the case company is provided. Third, the strategy of the case company is presented. Fourth, the innovation agenda of the case company is presented to provide the context of Living Lab. The fifth section covers the background of Living Lab. Then the characteristics and objectives of Living Lab are showed. Then, Living Lab is put into the context of strategy and innovation agenda. Finally a comparison to other living labs is presented. However, this chapter has been excluded on this version of the study.

6 CONCLUSIONS

In this final chapter, the main conclusions of this study are presented. It provides a research summary, offers the main findings, and explains the managerial recommendations for the case company. In the end of this chapter suggestions for further research are presented.

6.1 Research Summary

This section answers the research questions and restates the importance of the topic, the research gap and purpose of the study.

The aim of this thesis was to explore the concept of living lab. The research was practical, geared towards solving a problem of how to understand, analyze and further develop case company´s Living Lab. The study was motivated by the general lack of living lab research, including the areas of strategy, open innovation, user-centric innovation and the reasons to use it for business purposes. Furthermore, the study contributes to the lack of service related industries open innovation study as well as the need to study new phenomena in innovation with the traditional academic view of strategy. The research questions that the study was set out to answer consist of one main research question and three sub-questions.

Research question: How does living lab foster organization´s strategy and innovativeness?

The objective of the first research question was to broaden managerial understanding of living lab. From strategy perspective living lab is a method to implement strategy and thus achieving strategic objectives. Furthermore, strategy forms the foundation, the guiding principle for living lab where to play and why. Companies also need resources, capabilities and competencies to achieve strategic objectives, thus operate living lab. Typically change is needed when new capabilities are required or new model is

introduced to organization. However, living lab can also challenge and reshape strategy through innovation.

From innovation perspective living lab is a method to exploit open innovation and user-centric innovation – the two main themes of current innovation discussion in academic and business. These two concepts were examined in the literature review in Chapter 2. Hence, living lab enables collaborative innovation and thus improves the innovativeness of the company. This research question will be also covered in the next section by using the theoretical framework developed in Chapter 2.

Sub-question 1: What is the background of case company´s Living Lab?

The first sub-question was inspected from empirical perspective to understand the origin of case company´s Living Lab, and the context where does it relate: strategy and innovation. However, the more detailed analysis of this sub-question cannot be included on this version of the study.

Sub-question 2: For what purposes case company´s Living Lab can be used?

The second sub-question was examined from theoretical and empirical perspectives. Chapter 3 presented first common insight from living lab and its purposes, whereas Chapter 5 focused on case company´s Living Lab. However, the more detailed analysis of this sub-question cannot be included on this version of the study.

Sub-question 3: How does the case company´s Living Lab integrate with case company´s corporate strategy and innovation?

The analysis of this sub-question cannot be included on this version of the study.

Next the key findings are presented in the body of existing literature.

6.2 Key Findings in the Light of Earlier Research

This study has researched how living lab concept fosters organization´s strategy and innovativeness. The findings of the study present that living lab both implement and develop strategy. Furthermore, living lab fosters open innovation and user-centric innovation, thus innovativeness in the organization. This section presents the main findings in three parts: strategy/living lab, innovation/living lab, and strategy & innovation/living lab

Strategy / Living Lab

The link between strategy and living lab is clear but somehow controversial. It is an area that has not been clearly covered in previous living lab studies. However, this study has presented that there is a direct linkage between strategy and living lab, especially in the business context, which this study supports.

Furthermore, there is a strategic background for EU-driven living labs, which aim to tackle major challenges, such as healthcare and environmental issues. Hence, the strategy literature was also offered to understand the on-going innovation agenda of the case company. It also creates the context to understand case company´s Living Lab further.

However, this study has argued that living lab should be understood also in the context of strategy. Living lab fosters organization´s strategy through both implementation and formation. Hence, living lab should be tied to business strategy. Strategy should form the core of all corporate activities, including living lab.

However, the more detailed analysis of this area cannot be included on this version of the study.

Innovation / Living Lab

One approach to exploit open innovation and user-centric innovation, and thus improve innovativeness and achieve growth, is living lab. The findings from this study has

supported the claim of Oliveira (2010) that living lab is an efficient way to discover what users want and need, and also their unexpressed needs. It is a method to engage users in creating, prototyping, validating and testing new services, businesses, markets and technologies in real-life context (Gall & Burn, 2008). Furthermore, this study supports the claim that living lab can provide structure and governance to the user participation (Almirall & Wareham, 2008). Therefore, living lab has a significant role in successful implementation of strategy and innovation initiatives. It offers a new and efficient approach to collaborate with customers in order to drive organization´s growth strategy. However, the more detailed analysis of this area cannot be included on this version of the study.

Strategy & Innovation / Living Lab

To sum up the key findings of this study how living lab fosters organization´s strategy and innovativeness the contextual framework presented in the literature review is exploited. However, this area cannot be included on this version of the study.

6.3 Recommendations for the Case Company

Based on the findings of the empirical findings and earlier research, recommendations to the case company are presented here. The results of this study can be exploited to three main areas: the further development of case company´s Living Lab before its launch, the development of innovativeness and fostering the achievement of strategic objectives. However, the more detailed analysis of this area cannot be included on this version of the study.

6.4 Suggestions for Further Research

While numerous opportunities arise as potential areas of future research, this study highlights four areas. The first area is related to the launch of Living Lab. It would be interesting to study how the case company manages its Living Lab in a real world, and

how for example the key findings and recommendations of this study are concretized. This could include an ethnographical study of users of Living Lab, including customers and employees. The second area for future research is related to the need for more critical studies on the quality of living lab methods and processes. This could also be studied through the case company´s Living Lab after its launch when the methods and processes are in use. The third area relates to the cooperation and networking with other living lab companies. It would be interesting to study a common living lab of companies as an example of common open innovation activity. As the field of living lab and open innovation is still rather young, the possibilities for research in this area are extensive. Therefore, it would be interesting to study how these fields are going to develop in Finnish service industries in the future. However, it is possible that the competitors of the case company will react by developing their own living labs. Perhaps in the future there will be several living labs in the Finnish service industries.

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Interviews

1. Director, Case Company, 14.11.2011, Helsinki.
2. Manager, Case Company, 14.11.2011, Helsinki.
3. Manager, Case Company, 15.11.2011, Helsinki.
4. Manager, Case Company, 15.11.2011, Helsinki.
5. Jarmo Eskelinen, CEO Forum Virium, Vice Chairman of ENoLL, 15.11.2011, Helsinki.
6. Director, Case Company, 21.11.2011, Helsinki.
7. Director, Case Company, 30.11.2011, Helsinki.
8. Executive, Case Company, 2.12.2011, Helsinki.
9. Manager, Case Company, 25.1.2012, Helsinki.
10. Executive Vice President, Case Company, 27.1.2012, Helsinki.
11. Director, Case Company, 2.2.2012, Helsinki.

APPENDIX A – INTERVIEW TEMPLATE 1 (CASE COMPANY)

Background of Interviewee

1. Current job/role in the case company
    a. Brief job history
    b. Responsibilities
    c. Role of innovation and development in work
    d. Role of the unit you represent in the case company

Company and Business Environment

1. Market sitution
    a. Strengths
    b. Weaknesses
    c. Opportunities
    d. Threats
2. Competitive advantages
3. Future challenges
    a. Impact on innovation

Strategy

1. Strategy of case company
    a. Strategic objectives
2. Integration to innovation
    a. Strategic initiatites/focus areas
3. Challenges in strategy
4. Challenges in the integration between strategy and innovation

Background of Innovation

1. Role of innovation at the case company
2. Current innovativeness
3. Background of innovation initiative
4. Background of using external partners, such as IBM
5. Current market environment and industry situation (competition etc.) in innovation
6. Practical challenges in innovation

Objectives of Innovation

1. Objectives
    a. Long term
    b. Short term
    c. Strategic objective
        i. product, service, concept, business model
        ii. incremental vs. radical innovation
    d. Open innovation
    e. User-centric innovation
2. Role of Living Lab

Innovation Stakeholders

1. Management
2. Employees
3. External
    a. partners
    b. customers
    c. open innovation

Living Lab

1. Background
2. Definition
3. Purposes
4. How to use
5. Target segment
6. Distribution channels
7. Roles
    a. managers
    b. employees
    c. customers
    d. partners

Development Ideas

1. Future direction of innovation
    a. Compared to competitors
    b. Innovation role in addressing future trends, committing customer relationship and increasing customer experience

2. Living Lab
    a. Suggestions for improvement
3. Other comments

APPENDIX B – INTERVIEW TEMPLATE 2 (LIVING LAB EXPERT)

Background of Interviewee

1. Current job/role
    a. Brief job history
    b. Experiences from innovation
    c. Experiences from living lab
    d. Experiences from the cooperation with companies in the areas of innovation and living lab

Background of Living Lab

1. Background of living lab
2. Theoretical background of living lab
    a. Theories and other sources
3. Expansion to Finland
    a. When, who, how, why and where
4. Current situation of living lab in the world and in Finland

Living Lab – What Is It

1. What is Living Lab
2. Purposes to use living lab
3. Role of external partners and other stakeholders

Living Lab ´Ideal Model´

1. Ideal model to use living lab
    a. How should it work
    b. How to build and launch
    c. How to operate
    d. Purposes
    e. Potential achievements

Living Lab & Business Focus

1. Purposes for companies to use/exploit living lab
2. Reasons to establish living lab
    a. strengths
    b. weaknesses
    c. opportunities
    d. threats
3. Key considerations
4. Key considerations for the case company

Living Lab & Innovation

1. Role in innovation
    a. open innovation
    b. user-centric innovation
    c. new innovation trend