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Innovation Culture in Five Dimensions
Identifying Cultural Success Factors and Barriers for Innovation

Master of Science Thesis
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Abstract

Innovation is widely regarded as a key factor for creating both societal and economic progress. On the level of the firm, innovation has been argued to be crucial for the firm's competitive survival. Scholars also argue that firms have capabilities for innovation that can be understood as a system of several interdependent elements. Culture has been claimed to be one such element. The importance of a firm's culture has also been emphasized in other fields of organizational research. Despite the high level of attention dedicated to both innovation and culture, few studies have tried to understand the concept of an "innovation culture" or how to develop such a culture.

The purpose of this study is to contribute to the understanding of innovation culture by proposing a framework that explains the concept and by identifying success factors and barriers that influence its development.

To fulfill the purpose of the study, a research design was used in which a literature study was combined with an interview study. The interviews were conducted with managers from eight Swedish firms that have been ranked among the top 100 most innovative firms in the world. The literature study resulted in an initial framework which was subsequently revised based on empirical findings. In the empirical study, cases of innovation culture in the responding firms were described and the cases were also used as a basis for identifying success factors and barriers that influence the development of innovation culture.

The proposed innovation culture framework consists of five dimensions: innovation readiness, creativity and learning, leadership and entrepreneurship, market orientation, and motivations and relations. In addition, each dimension consists of a number of themes whose relations to previous literature are clarified.

A number of success factors and barriers that influence the innovation culture are identified. They are initially organized according to the dimensions of the innovation culture framework but are then aggregated into overall factors. The success factors and barriers may be used to guide managers in the development of innovation culture. The identified overall success factors are: a shared purpose, supportive leadership, willingness to dedicate resources, and an organization-wide customer focus. The barriers are: risk-aversion, excessive control, and insufficient cross-functional collaboration.

Acknowledgements

Table of Contents

List of Figures

List of Tables

1 Introduction

This chapter presents the background, purpose, research questions and limitations of the master's thesis.

1.1 Background

The role of innovation in achieving both societal and economic progress has long been recognized. For example, Schumpeter (1942) argued that innovation and creative destruction constitute an evolutionary process which is the basis for capitalism. On the level of the firm, innovation is considered a crucial factor for success. Drucker (1985, p. 67) stated that "*[a]t the heart of that activity [successful entrepreneurship] is innovation: the effort to create purposeful, focused change in an enterprise´s economic or social potential*". Chesbrough also expressed the need for firms to innovate: "*Most innovations fail. And companies that don't innovate die.*" (Chesbrough, 2003, p. xvii). Firms therefore need to find ways to innovate or face the risk of being outcompeted.

In addition to innovation, other factors have been proposed as sources of firm advantages. The resource-based view developed by Penrose (1959) suggests that firms derive advantages from possessing bundles of tangible and intangible resources. The concept of core competencies extends the argument of the resource-based view and Prahalad and Hamel (1990) claim that firm advantages are derived from hard-to-imitate competencies. They state that "*[t]he critical task for management is to create an organization capable of infusing products with irresistible functionality or, better yet, creating products that customers need but have not yet imagined*" (Prahalad & Hamel, 1990, p. 80). Eisenhardt and Martin (2000) argue for the concept of dynamic capabilities, a set of processes that show commonalities across best practice firms. The concept has been defined as "*routinized activities directed to the development and adaptation of operating routines*" (Zollo & Winter, 2002, p. 339). Dynamic capabilities allow firms to renew themselves in response to changing external environments (Teece, Pisano, & Shuen, 1997) and can therefore be a way for firms to survive the creative destruction process described by Schumpeter.

Recently, scholars have argued that the capabilities view can be applied to innovation and an increasing number of large firms set their focus on developing a capability to being innovative (Börjesson, Elmquist, & Hooge, 2014; O'Connor, Paulson, & DeMartino, 2008). It has been argued that a firm's innovation capabilities are important both for its competitiveness (Björkdahl & Börjesson, 2012), and its growth (O'Connor, 2008). However, an issue in previous studies is that they have focused on the overall system for innovation capabilities, rather than going into depth on any of the constituent dimensions. To better understand innovation capabilities, it is therefore necessary to further explore each of the dimensions that have been identified in previous literature.

An organizational innovation culture is often regarded as a part of the major innovation capabilities, see e.g. (Björkdahl & Börjesson, 2012; Keskin, 2006; O'Connor, 2008; O'Connor et al., 2008). However, few studies have adopted an innovation capabilities view in understanding organizational culture. In change management literature, culture has been identified as one of the main determinants for success in organizational transformation, which further stresses the importance to understand innovation culture properly. The following quote attributed to Drucker captures the importance ascribed to organizational culture; "*culture eats strategy for breakfast*". Tushman and O Reilly (1996) have also acknowledged culture as the most important factor for succeeding with innovation initiatives. They claim that radical innovation requires a distinctly different culture compared to the mainstream activities of the firm and that radical innovation should be managed in a separate, ambidextrous organization. A meta-analytic review by Büschgens, Bausch, and Balkin (2013) also reveals that the structure and hierarchy (or lack thereof) may impact the ability to innovate and shows that innovative organizations are most likely to have a culture which emphasizes an external orientation and internal flexibility. Innovation can also be inhibited by cultural factors, as shown by Leonard-Barton (1992) who concluded that certain cultures can inhibit innovation and that the capabilities that once led a firm to success can become "core-rigidities".

As presented, existing literature has stressed the importance of organizational culture in determining the firm's success, while also identifying innovation as a crucial component for competitive survival. However, few studies have examined innovation culture. Dobni (2008) discussed innovation culture, but focused on developing and testing a scale to measure an innovation culture construct using a quantitative approach. It is therefore interesting to study innovation culture using a qualitative approach in order to gain a deeper understanding for the concept. Providing a deeper understanding is interesting since it may offer guidance for managers who wish to develop the innovation culture of their firms. It is also interesting to identify success factors and barriers to develop innovation culture. This is relevant since it may help firms to develop their innovation culture and, which may lead the firm to become more innovative.

1.2 Purpose
The purpose of this study is to contribute to the understanding of innovation culture by proposing a framework that explains the concept and by identifying factors that influence its development. Fulfilling the purpose includes identifying and explaining the dimensions of innovation culture as well as identifying success factors and barriers for firms to develop their innovation culture. The study is conducted on Swedish firms that are considered to be innovative.

1.3 Research questions
In order to fulfill the purpose outlined above, two research questions have been identified which have guided the overall research.

- What constitutes innovation culture?
- What factors do Swedish firms identify as success factors and barriers to develop innovation culture?

The first research question is approached by first studying existing literature to gain an understanding for what has been previously written about innovation culture. From that literature review, a framework for describing innovation culture is constructed. Then, an empirical study is conducted to obtain a first-hand perspective of innovation culture from Swedish firms. The findings from the empirical study are analyzed and the results are used to revise and develop the framework so that it is based on both existing literature and empirical findings. From the analysis, a number of success factors and barriers to develop an innovation culture are also identified.

1.4 Limitations

The study is limited to focus on Swedish firms, and in particular, large industrial firms. This rather narrow sample likely has implications for the success factors and barriers that are identified since they may be different for small firms. The study is also limited to two departments in each participating firm in the study: R&D and sales and marketing. While innovation culture likely exists in other departments as well, those have not been included in this study.

2 Methodology

This chapter describes the method that is used to fulfill the purpose of the study. A qualitative approach has been applied, including a literature study and an empirical study using interviews. The material was analyzed in order to form an innovation culture framework.

2.1 Research design

This study has applied a qualitative research design since it was regarded suitable to the research topic of organizational culture and innovation. According to Denison (1996) qualitative approaches are most common when studying culture. In line with an argument by Bryman and Bell (2011), qualitative research design is appropriate since the purpose of the research is to understand innovation culture as perceived by individuals in firms.

The research process can be divided into three main broad phases; (1) development of a framework for innovation culture based on existing literature, (2) the empirical study of innovation culture and (3) data analysis and revision of the framework and synthesis of success factors and barriers to develop innovation culture. These three phases are illustrated in *Figure 1* along with the activities conducted in each phase. The first step of developing the literature framework was to conduct a literature scan where influential literature on the topics of innovation capabilities and organizational culture was identified and reviewed. Literature on related topics, such as organizational- and dynamic capabilities was also identified and read to give an understanding of the topics. The identified literature was used to develop an initial framework for innovation culture.

Second, the empirical study was initiated in parallel with the development of the framework for innovation culture. An interview guide was developed based on the literature study and it was subsequently tested to get input on the questions and to ensure that the questions were clear. It was also tested to make sure the questions were related to the area of study, even though the interview study also aimed to allow relevant outlying responses. The interview guide was revised based on the feedback and was then used for the interview study.

Third, the findings from the interviews were analyzed and incorporated into the literature framework to form a final framework. This framework reflects the main dimensions of an innovation culture and highlights relevant themes and factors for each dimension. In addition, success factors and barriers to developing an innovation culture are discussed.

It should be noted that this research was conducted on assignment from Preera, a Swedish management consulting firm. The research topic was selected in cooperation with Preera in order to deepen the firm's knowledge on innovation, but the research was conducted independently from the firm except for e.g. testing of interview guide.

Complementary literature scan and review

Literature scan → Literature review → Synthesis of literature

Pre-testing → Empirical study

Data analysis → Final framework
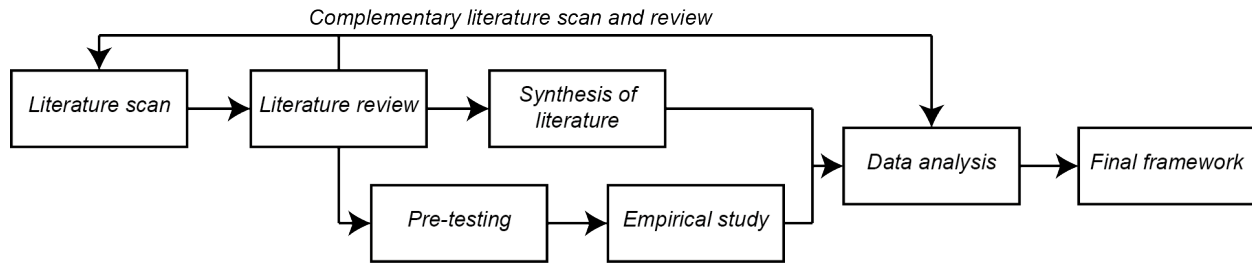
Figure 1 Illustration of the research process. Source: Authors.

2.2 Research on organizational culture

It may be argued that the study of organizational culture poses certain challenges for researchers. One complicating issue is that culture cannot be directly observed (Hofstede, Neuijen, Ohayv, & Sanders, 1990). To study culture therefore requires going beyond the observable to explore factors such as mental models and deep-seated beliefs. Since culture incorporates objects which such as mental models, which are difficult to study, it is important to define culture and clarify the approach which is used in this study.

According to Hofstede et al. (1990) organizational culture consists of values, rituals, heroes and symbols (for a thorough description of organizational culture, see section 3.5). Rituals are viewed here as organizational behavior, in particular the behavior of the firm to promote innovation. Rituals therefore concern actions that the firm undertakes which are aimed at promoting innovation but which also have implications for how the firm works with innovation. Values are basic convictions about what is right, good or desirable. Heroes are individuals in an organization which play important roles as examples for others and in effect influence the behavior of individuals in the organization (Hofstede et al., 1990). Both values and heroes are included in the study. Finally, symbols are the physical artifacts that bear a shared meaning by individuals in a culture, which may not be apparent to individuals who are not part of the culture.

The main focus of the study is devoted to rituals in the form of organizational behavior. It is argued here that rituals are highly relevant to the study of culture since they are guided by the current culture but also influence future culture. This relationship is clarified in *Figure 2*. It may be argued that the historical path of the organization has a strong influence on its current culture and because of a shared history; firms tend to reproduce old behavior. Past choices in an organization become embedded in its current routines and practices through path dependencies, and in that sense they come to reflect the rules and culture of the organization (Sydow, Schreyögg, & Koch, 2009). Sydow et al. (2009) go on to claim that culture is part of a broader organizational context which influences decision makers and indirectly guides the actions of the organization. Hence, culture and behavior are interdependent; an innovation culture influences the behavior of the organization, but the behavior also influences the innovation culture. For this reason, the study of firm behavior or routines is highly relevant to understand a firm's innovation culture.

To a lesser degree, this study also incorporates heroes and values in examining innovation culture. Heroes are considered interesting since descriptions of organizational heroes may provide insight into behavior which is valued and strived for by the organization. Values arguably play a similar role since they determine what is right and desirable from members of an organization. Consequently, both heroes and values are likely to have important normative consequences for an organization's culture.

Even though symbols have been identified as a part of organizational culture, they were omitted from this study. While symbols may be evident to someone who is familiar with the organization, they are unlikely to be evident for an outside researcher. Studying symbols therefore requires that they first be identified and then interpreted. Identifying and interpreting symbols was considered to be difficult as outside researchers and was not considered to be necessary to fulfill the purpose of the research. Consequently, symbols are not an object of study.
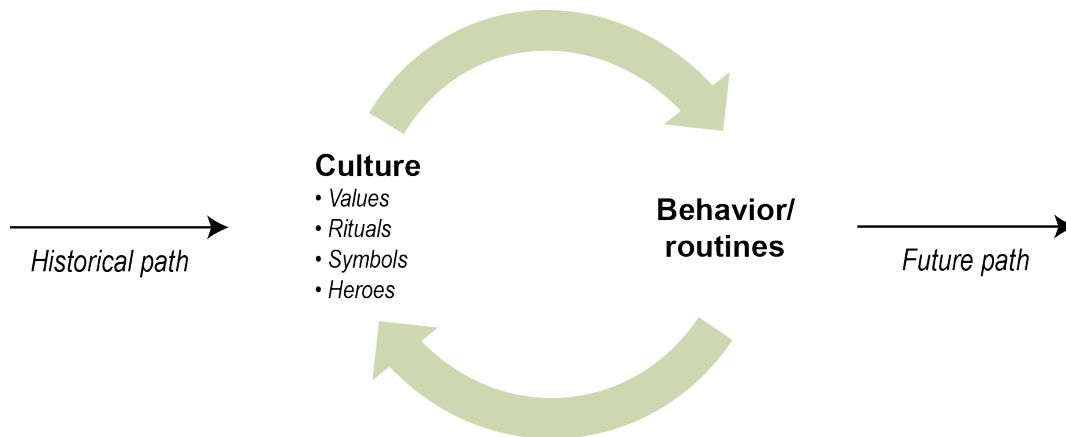
Figure 2 Interaction between a firm's routines and its culture. Source: Authors.

2.3 Data collection methods

For this study, a mainly qualitative approach has been used, and it was considered appropriate since that approach is most common for studying culture (cf. Denison, 1996). First a literature study was conducted, with the focus on identifying and reviewing previous literature and synthesizing that literature into an innovation culture framework. Second, an interview study was performed, where semi-structured interviews were held with managers from eight innovative Swedish firms.

2.3.1 Literature scan and review

The starting point for the research was to conduct a literature review in order to identify relevant previous research in the area. The literature review serves several purposes as it helps to position the study in relation to previous research, provides information on strategies for data collection and provides support for data analysis (Bryman & Bell, 2011). According to Boote and Beile (2005) the literature review clarifies the context and scope of the study and critically examines what is known as well as what needs to be known in the field of study. A good literature review

also synthesizes existing literature to provide new perspectives and is important for ensuring high quality and useful research (Boote & Beile, 2005). The literature study conducted during this thesis therefore aims to present existing research on innovation and organizational culture, but also to provide a new perspective exploring the concept of innovation culture.

To collect literature on the research topic articles and books within the fields of innovation and organizational culture and related topics such as innovation capabilities, motivation and market orientation were collected. Articles were collected by researching databases available at the library of Chalmers University of Technology. The most commonly used databases were Sage Journals, ProQuest, Books24x7, Business source premier, and Emerald. The databases were searched using keywords such as "innovation culture", "organizational culture", "innovation capabilities" and "dynamic capabilities". The abstracts of the identified articles were read and the articles that were considered relevant to this research were selected and read fully. Additionally, the reference lists of the selected articles used to identify additional articles that were relevant but which were not identified through the keyword searches. To synthesize the knowledge gathered in this phase, a summary covering most of the articles was written. The articles were also structured into different categories according to their research topic. In this way, comparisons of the authors' different perspectives were facilitated.

2.3.2 Development of the framework

The framework proposed in this thesis was developed in two main phases; the literature framework and the revised framework based on empirical findings.

Initially, findings from the literature study were used to construct a literature framework for innovation culture. Based on the literature study, three main authors were identified who discussed culture and innovation; Dobni (2008), McLaughlin, Bessant, and Smart (2008) and Denison and Mishra (1995). From those, the work of Dobni (2008) was considered to be most similar to this study. Dobni (2008) was used as a basis for developing the literature framework and the dimensions identified in the literature framework are inspired Dobni´s dimensions. However, when new literature was identified which added to the findings of the authors mentioned above, the dimensions were renamed to better reflect the addition of new literature. For example, the dimension of motivation and relations was not discussed by Dobni (2008), but since a significant body of literature in this area was identified, the dimension was included in the literature framework.

Following the collection of empirical data, the framework was revised to incorporate the empirical findings. Most notably, two dimensions were renamed. One was termed leadership and entrepreneurship, since several respondents emphasized leadership as important for innovation culture. The other was named creativity and learning. Some of the previous dimensions were thus grouped into the same dimension to reflect that respondents often viewed them as closely related. Differences between the revised framework and the literature framework are highlighted

and success factors and barriers that were identified as important to develop an innovation culture are presented in each dimension.

2.3.3 Interview study

The interview phase of the research study aimed to provide empirical knowledge about innovation culture in innovative Swedish firms. According to Larsen (2009), a qualitative study makes it possible to achieve more in-depth answers to the research questions by use of personal interviews. In-depth answers along with some organizational context were considered as necessary in order to study the phenomena of innovation culture in a satisfactory way.

Since the research had a clear purpose and research questions, semi-structured interviews were considered an appropriate method for collecting data. According to Bryman and Bell (2011) semi-structured interviews are appropriate when the research has a clear purpose since they allow the researchers to address more specific issues. Semi-structured interviews also allow for an open dialogue (May, 2001) and were therefore considered suitable for studying innovation culture. In addition, semi-structured interviews facilitate comparability between the respondents' answers and allow the interviewer to deviate from the interview guide to follow up on particularly interesting topics (Bryman & Bell, 2011). Thus, semi-structured interviews were considered appropriate since they allow for both structure and flexibility.

The interview guide was developed in two steps. First, the guide was developed based on the literature review. The interview guide was structured to reflect the framework that was developed from the literature review. The final interview guide can be found in Appendix G – Interview template. Four to six questions were formulated for each of the five dimensions of the framework as well as a few general questions. The interview guide was subsequently pre-tested by having consultants at Preera and our Chalmers tutor give their input on the questions. Following the pre-test, a number of questions were removed and some were reformulated. In particular, questions were reformulated to encourage the respondents to illustrate their responses through examples. Having the respondents clarify their points through examples was considered important in order to avoid formulaic responses and for providing a deeper understanding of innovation culture. The questions in the interview guide were ranked, to ensure that the most important questions were answered. The final guide included 21 questions, out of which three were general questions.

Table 1 The firms taking part in the study.

Firm	Thomson Reuter	Forbes
ABB	2013	-
Alfa Laval	2011	-
Assa Abloy	-	2013
Atlas Copco	2011	2013, 2012, 2011
Ericsson	2013, 2012, 2011	-
Sandvik	2013, 2012, 2011	2013, 2012, 2011
Scania	2012, 2011	-
Volvo	2011	-

The interview study included a total of eight firms, which were selected based on rankings of the world's most innovative firms. Two such ranking lists were used; Thomson Reuter's Top 100 Innovators and Forbes World's Most Innovative Companies. For both rankings, the last three years were included and during that time, eight Swedish firms appeared on the list. Even though ABB has its headquarters in Zürich and is sometimes considered to be a Swiss firm, it was included in the sample due to its Swedish roots and ownership. The selected firms and the ranking lists on which they appear are shown in *Table 1*.

For each of the eight selected firms, two interviews were conducted to get a broader description of each firm's innovation culture, see *Table 2*. In order to get different perspectives on innovation culture respondents were selected from two different departments. Respondents were managers from R&D or innovation and the sales or market department. The R&D or innovation department was selected since it was considered to be most closely associated with the firms' innovation initiatives. The marketing and sales department was selected since it could provide a perspective on the firms' market orientation and how the firms worked with understanding their customers.

Table 2 Overview of the conducted interviews.

Firm	Department	Date	Interview type	Approximate duration
ABB	Sales & Marketing	2014-04-30	Phone	1 h
	R&D	2014-04-24	In person	1 h
Alfa Laval	Sales & Marketing	2014-03-23	In person	1 h
	R&D	2014-03-23	In person	2 h
Assa Abloy	Sales & Marketing	2014-04-14	In person	1 h
	R&D	2014-04-14	In person	1 h
Atlas Copco	Sales & Marketing	2014-04-25	Skype	1 h
	R&D	2014-04-15	In person	2 h
Ericsson	Sales & Marketing	2014-05-19	Skype	1 h
	R&D	2014-03-14	In person	1 h
Sandvik	Sales & Marketing	2014-04-08	Skype	1 h
	R&D	2014-04-25	Phone	1 h
Scania	Sales & Marketing	2014-04-09	In person	1 h
	R&D	2014-04-09	In person	1 h
Volvo	Sales & Marketing	2014-05-07	In person	1 h
	R&D	2014-03-28	In person	1,5 h

2.4 Data analysis

The data analysis was divided into the following phases: (1) initial coding of empirical material, (2) generation of first order concepts, (3) development of second order themes and (4) distilling those themes into aggregate dimensions. The analysis largely follows the structure outlined by Gioia, Corley, and Hamilton (2013) and the steps in the data analysis process are shown in *Figure 3*.

Before analyzing the empirical data, the conducted interviews were transcribed to enable proper coding. The first step of the analysis was then to create codes that reflected the respondents' answers. In this first phase around 100 codes were identified and initially grouped, mainly according to the literature framework, but also after some emerging themes. According to Gioia et al. (2013), these early phases often involve 50-100 codes from just 10 interviews, making it necessary to distill the data further. Subsequently, the codes were refined and distilled into a more manageable number of first order concepts, based both on concepts from the literature study and on new data that emerged from the empirical material.

After developing first order concepts, these were grouped into larger themes. In second-order analysis Gioia et al. (2013) advise that researchers developing themes should be guided by the question of whether the emerging themes truly reflect the phenomena that is observed. The focus in this study was therefore to ensure that the themes were relevant to explain an innovation

culture. To ensure that themes were relevant, emerging themes were compared with the literature framework. In some cases there were few differences between the emergent themes and what had been identified in previous literature. However, in some cases the emergent themes required that new literature be reviewed and added. For example, several themes emerged which related to a wider view of leadership than discussed in the literature framework. Literature on leadership therefore needed to be reviewed to complement the empirical findings. Finally, the identified themes were grouped into the aggregate dimensions of innovation culture.

Initial coding → Development of 1st order concepts → Grouping into 2nd order themes → Aggregate dimensions of innovation culture

Figure 3 The data analysis process. Source: Authors.

2.5 Methodological considerations

The methodological choices which were made in this research have implications for the quality of the research. The main considerations that are presented here are the selection of responding firms and choice of data collection methods.

The responding firms were selected since they have been identified by Forbes and Thomson Reuter as among the most innovative firms in the world. However, it is reasonable to question the measures for innovation or innovativeness used in these ranking lists. For example, Thomson Reuter's list is largely based on patents, including factors such as number of patents, share of successful patent applications, number of markets in which an invention is patented and the number of citations for each patent (Thomson Reuter, 2014). Forbes bases its list on "innovation premium", which is the difference between market capitalization and a net present value of cash flows from existing business (Dyer, 2013). While these measures give some indication of innovation output or innovativeness, both methods arguably exclude a large number of firms. For example, Thomson Reuters's ranking excludes firm that do not patent inventions and Forbes's list excludes firms that are not publicly listed.

Since both rankings that were used to select respondent firms use limiting measures for innovation, it is reasonable to assume that the sample of innovative firms is skewed. It may even be fair to ask if the studied firms are innovative. It may be argued that the responding firms are innovative in the sense that they are large listed firms, which focus on protecting inventions through patenting and are successful at that. However, a large part of potentially innovative firms are also excluded, for example small firms, unlisted firms, or those with less of a focus on patenting. As a result, the findings should not be generalized to a population of all firms. Instead, the findings are likely to be valid for firms that are similar to those studied here; large industrial firms in the Nordics.

Another consideration is the choice of departments at which the interviews were carried out. In the research, two interviews were carried out at each firm, one at an R&D and one at a sales and marketing department. To get a more comprehensive picture of innovation culture, it would be interesting to carry out interviews in more departments. The choice of R&D and sales and marketing was done to reflect different parts of the firm, one being internally oriented (R&D) and the other externally oriented (sales & marketing). Also, these two departments were considered important to the firm's innovation culture since R&D is largely tasked with producing innovative output and sales and marketing partly work with innovative input from the firm's customers. However, as a result of selecting only two departments, this study does not present a full picture of innovation culture in all the departments of a firm. It would be interesting to conduct a study which included fewer firms, but more departments to study an organization-wide view of innovation culture.

In addition, there are some considerations that need to be highlighted related to using interviews as a data collection method when studying culture. First, it is important to note that the empirical material in this thesis reflects the opinions of individuals and not of firms. To put it more clearly, the empirical material is based on interviews with 16 individuals who work in eight different firms; it is not based on interviews with eight firms. The answers given by the individual respondents should not be transferred to a firm or department level and the answers may not be representative for the firms' overall culture. Indeed, since the firms in this study are very large (16 000 – 140 000 employees), culture is likely to differ significantly in the firms. However, the purpose of the report was not to understand or map the innovation culture of any particular organization, but on understanding the wider concept of innovation culture. Consequently, the answers given by respondents do not need to be considered representative of the firm. It is sufficient to view the respondents as individuals rather than as representative of firms or departments.

A second issue related to using interviews is that of respondent bias and espoused truths. The culture described by respondents may not be the actual culture in the firm. Instead, answers may reflect a desired or ideal culture or the culture as perceived by the individual respondent. It is also possible that respondents describe their firm's culture in a more positive way in interviews, resulting in biased answers. A deeper understanding of innovation culture could likely be obtained by combining interviews with other methods, such as participant observation. However, that was considered unfeasible given the scope and time of this thesis.

3 Literature review

In the following chapter, previous literature that is relevant for studying innovation culture is reviewed. A definition of innovation is proposed and a capabilities view of the firm is presented. Innovation capability is viewed as consisting of several interdependent elements, one of which is culture. The concept of organizational culture is presented and its links to organizational effectiveness is reviewed. It is then proposed that organizational culture may promote innovation and such a culture is termed innovation culture.

3.1 Innovation

Innovation has been identified as key factor to firm performance in several studies (Drucker, 1985; Higgins, 1995; Pohle & Chapman, 2006). Assink (2006) writes that: *"In a quickly changing and uncertain world, innovation is the key to competitive advantage."* (Assink, 2006, p. 217) This statement acknowledges that there are new challenges for firms today due to a more rapidly changing business environment and as a consequence, firms need to innovate in order to stay competitive. Samson and Lawson (2001) add that globalization and the development of a knowledge economy are parts of explaining the increased importance of innovation: *"The emergence of the knowledge economy, intense global competition and considerable technological advance has seen innovation become increasingly central to competitiveness."* (Lawson & Samson, 2001, p. 378). Thus, innovation plays an important role for businesses and managers. At the same time, however, many researchers have found that innovation is difficult to manage (Assink, 2006; Lawson & Samson, 2001; O'Connor, 2006), even though attempts have been made to aid managers and organizations to achieve innovation for several decades, see e.g. Drucker (1985).

While there is some general understanding of what innovation stands for, there are still a variety of definitions of innovation and the consensus of what innovation means has changed over the years (Cumming, 1998). Innovation has been defined as: *"the process of creating something new that has significant value to an individual, a group, an organization, an industry, or a society. Innovation is how a firm or an individual makes money from creativity."* (Higgins, 1995, p. 33). This is closely related to the definition of Samson and Lawson who state that: *"Innovation is the mechanism by which organizations produce the new products, processes and systems required for adapting to changing markets, technologies and modes of competition."* (Lawson & Samson, 2001, p. 378). Both of the definitions view innovation as a *process* (or a *mechanism*) to creation. A related definition is:

"The process of successfully creating something new that has significant value to the relevant unit of adoption." (Assink, 2006, p. 217).

Thus, innovation is often connected to *value creation* and *newness*. Similar to Higgins, Granstrand (2007) defines innovation as something new which has been successful, referring to success as being technical, commercial and economic.

Two other definitions of innovation are: *"The first successful application of a product or process."* (Cumming, 1998, p. 22) and *"the adoption of an idea or behavior new to the adopting organization."* (Damanpour, 1996, p. 694). The latter two also focus on the *success* of something *new*, counting *adoption* as being a type of success. It seems as if innovation is generally considered to be referred to as something new, but exactly *what* is new differs. For example, it can be: a product or process (Cumming, 1998), a behavior (Damanpour, 1996), but also a business model (Amit & Zott, 2001). The wide description of innovation proposed by Kanter (2000) arguably incorporates multiple applications: *"[I]nnovation is the creation and exploitation of new ideas."* (Kanter, 1988, p. 170). In this case, every application of innovation is made room for under the work of *ideas*. *Success* (or adoption) is here synonymous to *exploitation* and the focus on the *process* is also a part of the definition - as the *creation (*of new ideas). In short, innovation has to do with *the process* of *successfully* creating something *new* with significant *value* to the *concerned* individual, group, organization, or society. This is also in line with the definition by Assink (2006) presented earlier.

As mentioned, there are several different types of innovations and some of these are presented below. Even though the most traditional view of innovation may be that of product innovation, other areas are becoming recognized as equally important. One area is business model innovation which is growing steadily and its importance is clearly illustrated by Pohle and Chapman (2006): *"Companies whose operating margins have grown faster than their competitors' over the past five years were twice as likely as their lower performing peers to emphasize business model innovation."* (Pohle & Chapman, 2006, p. 36).

Markides (1999) shows that innovation is also used as a concept for strategy development: *"The hallmark of their [a list of economically successful companies] success was strategic innovation: proactively establishing distinctive strategic positions that were critical to shifting market share or creating new markets."* (Markides, 1999, pp. 59-60). Higgins (1995) states that there are four types of innovation: *product innovation*, *process innovation*, *marketing innovation*, and *management innovation*. Similarly, Francis and Bessant (2005) argue that innovation can be seen as one of four groups: *product innovation*, *process innovation*, *positioning innovation*, or *paradigm innovation*. Thus, there are at least four different areas of innovation as shown in *Figure 4*.
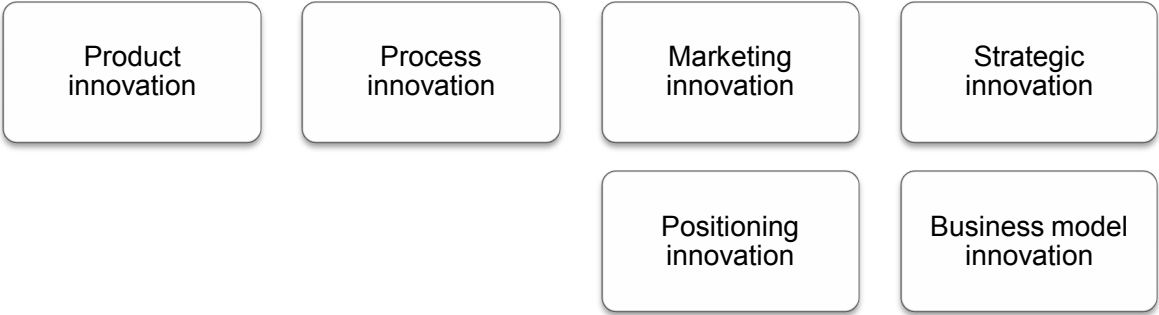
Figure 4 Different types of innovation, with related types aligned vertically. Source: Authors.

Innovation may also be categorized based on other parameters, such as increases in performance levels or impact on existing industries. As Schumpeter (1942) stated, innovation can be regarded as something disruptive. It can also be seen as incremental (McLaughlin et al., 2008; Swann, 2009) or radical (McLaughlin et al., 2008; O'Connor et al., 2008). These terms often relate to the performance improvement of an innovation over a previously existing product or service. It may also relate to the impact that the innovation has on an existing industry. More detailed descriptions of incremental and radical innovation are presented in *Table 3*.

Table 3 Different levels of innovation

Level of Innovation	Description
Incremental innovation	This is typically a type of innovation that enhances the performance of a product, a process or a system in a gradual manner. As the name suggests, the improvements are typically rather small and the development builds on traditional management structures and the innovation has few implications for the industry. Sources: Swann (2009), and McLaughlin et al. (2008)
Radical innovation (Disruptive innovation)	Also referred to as breakthrough innovations, these innovations often have a significant impact on the industry as a whole. Management practices necessary for radical innovation has often been described to differ from traditional methods for incremental innovation. A disruptive innovation is when the innovation transforms the established way of doing business in an industry or sector and thus has a large negative impact on those firms that are not able to adapt. Sources: O'Connor et al. (2008), Schumpeter (1942), and Assink (2006).

To summarize, innovation can be applied to several different areas of change, and be viewed as both a process and an outcome. Furthermore, it may be incremental, radical and/or disruptive.

3.2 Resource based view

Early ideas of the resource based view were developed by Penrose (1959) and it is now a widely proposed framework for explaining how firms achieve sustainable competitive advantage (Barney, 1991; Grant, 1991; Prahalad & Hamel, 1990). The resource based view adopts an internal perspective of the firm to explain differences in firm performance. The basic argument is that firms can profit from possessing unique resources that allow them to achieve sustainable competitive advantage. The resource based view complements external views such as industry analysis (e.g. the five forces framework) which claim that sustainable competitive advantage is achieved through unassailable industry positions (Porter, 1980).

Proponents of the resource based view claim that external perspectives fail to explain large differences in firm performance between firms in the same industries (Barney, 1991). External perspectives also assume that resources are highly mobile and that any differences in resources within industries are temporary. The resource based view contrasts these assumptions and claims that resources and firm capabilities are sources of competitive advantage. Firms should therefore focus internally on developing capabilities and resource configurations in order to achieve sustainable competitive advantage.

The resource based view has been used as a basis for strategy formulation in firms. Grant (1991) explains the implications of the resource based view on strategic management by clarifying the relationship between resources, capabilities, competitive advantage and strategy. Resources constitute the starting point for strategy formulation, where a firm's resources are identified and appraised in relation to competitors. Bundles of resources make up higher level capabilities through coordination between people and other resources (Grant, 1996). Capabilities may subsequently give rise to competitive advantage from which firms can profit. Finally, a strategy should be formulated which makes the best use of the firm's resources and capabilities and capitalizes on external opportunities.

Barney (1991) proposes a similar framework for understanding the relation between resources and strategy formulation. He claims that firms can achieve sustainable competitive advantage from possessing valuable, rare, inimitable and non-substitutable resources (so called VRIN-resources). In order to create sustainable competitive advantage a resource needs to fulfill all of these criteria. However, resources are "sticky", meaning that they are difficult to change (Teece et al., 1997). Consequently, a firm needs to have a long-term perspective when trying to modify or alter its resource base.

3.3 Organizational and dynamic capabilities

In the resource based view, capabilities are viewed as bundles of resources. According to Christensen (1997) organizational capabilities are made up of resources, processes and values. Resources include people, equipment and technology; processes are the activities that transform input to higher value output; and values include the mindset of individuals in the firm (Christensen, 1997). Organizational capabilities relate to what an organization is able or unable

to do (Björkdahl & Börjesson, 2012), implying that an organization cannot undertake actions for which it lacks capabilities.

In response to external changes and an increased pace of change in markets, firms may need to modify their organizational capabilities. It has been argued that firms can respond to external changes by exercising dynamic capabilities which are made up of processes, positions and paths (Teece et al., 1997). Dynamic capabilities relate to a firm's ability to change and develop existing capabilities and are therefore lower level capabilities (Börjesson et al., 2014). The purpose of exercising dynamic capabilities is to achieve organizational renewal by changing an organization's resources, competencies and often also its products. The term "dynamic" emphasizes the capacity to renew competencies in order to achieve congruence with a transforming environment and "capabilities" reflects the organizational need to reconfigure resources and competencies to cope with a changing environment.

The definition of dynamic capabilities helps to clarify the main differences compared to the resource based view. The resource based view is mainly concerned with achieving a sustainable competitive advantage by possessing VRIN-resources and can be claimed to adopt a fairly static view of the firm's environment. Dynamic capabilities on the other hand, focus on competitive survival in fast-changing markets and emphasize capabilities that allow the firm to transform in response to its environment.

Teece et al. (1997) argue that dynamic capabilities consist of processes, positions and paths. Processes are the managerial processes that describe the way things are done in an organization and can also be understood as routines or current practices. According to Teece et al. (1997), there are three types of processes: coordination/integration, learning and reconfiguration. Position refers to the current resources available to the organization, such as technology, intellectual property customer base etc. Paths are the strategic alternatives which the firm can act on as well as its path dependencies.

Eisenhardt and Martin (2000) criticize the view advanced by Teece et al. (1997) that dynamic capabilities are firm-specific. Eisenhardt and Martin (2000) claim that dynamic capabilities show similarities between firms and can therefore be regarded as best practice. They also argue that dynamic capabilities vary depending on market dynamism. In high velocity markets dynamic capabilities are simple and experiential rules of thumb, whereas in moderately dynamic markets they are detailed and analytic routines (Eisenhardt & Martin, 2000).

Danneels (2011) adds resource cognition as an important factor for dynamic capabilities by showing how Smith Corona, a manufacturer of typewriters, failed despite exercising dynamic capabilities. Resource cognition refers to the identification of resources and understanding of their value (Danneels, 2011). Danneels shows that while dynamic capabilities may be simple rules of thumb (as proposed by Eisenhardt and Martin (2000)), they require a correct assessment

of the underlying resources. Failure to fully understand the firm's resources can lead managers to undertake courses of action which may ultimately cause the firm to fail.

3.4 Innovation capabilities

Innovation capabilities are a subset of organizational capabilities and concern a firm's ability to innovate. Innovation capabilities have been defined as *"[t]he internal driving energy to generate and explore radical, new ideas and concepts, to experiment with solutions for potential opportunity patterns detected in the market's white space and to develop them into marketable and effective innovations…"* (Assink, 2006, p. 219). A firm's innovation capabilities therefore concern the ability to come up with, test and develop ideas into new concepts or products.

Firms face multiple barriers when developing and commercializing innovations. Large firms are generally apt at developing incremental improvements of existing products and services, but often fail in developing radical innovations (Christensen, 1997). Assink (2006) identifies five clusters of interrelated barriers to develop disruptive innovation capability. First, large organizations are often rigid and rely on previously successful designs to create future business success. These factors can create a status quo in the firm as well as risk aversion and organizational inertia. Second, obsolete mental models and an inability to unlearn greatly inhibit the firm's ability to develop and commercialize disruptive innovations. Mindset barriers may exist in the firm's management and inhibit innovative practices. Third, the corporate attitude in the firm may be risk-averse. Fourth, the processes for managing innovation may be unsuitable, and efficiency oriented management models are likely to give poor innovative output. Fifth, infrastructural barriers in and outside of the firm can also act as powerful barriers. Identifying and removing these barriers can substantially improve a firm's disruptive innovation capability (Assink, 2006).

It has also been argued that a system perspective is necessary to understand innovation capabilities. O'Connor (2008) proposes that a management system for major innovations comprises seven interdependent elements. She argues that major innovation capability is a highly complex management system, far more complex than the operating routines outlined by dynamic capability theory. It is proposed that a major innovation system consists of "*(1) an identifiable organization structure; (2) interface mechanisms; (3) exploratory processes; (4) requisite skills; (5) governance and decision-making mechanisms; (6) appropriate performance metrics; and (7) an appropriate culture and leadership context.*" (O'Connor, 2008, p. 314). The system perspective of innovation capabilities implies that the elements are interrelated and that firms need to consider how the elements interact in order to strengthen their innovative capabilities. Since the elements are interdependent, development of innovation capabilities likely involves changes to several elements. Considering the barriers identified by Assink (2006), developing innovation capabilities is a challenge for the firm along multiple dimensions.

3.5 Organizational culture

The concept of culture has been discussed on multiple levels of organization; ranging from national culture to group culture. Similarly, there are multiple definitions of the concept, depending on the level at which it is applied. The concept has perhaps been most widely used in the area of anthropology, but has also been applied in other areas such as sociology, social psychology and economics. From an anthropological perspective, Hofstede (2001) emphasizes shared mental models as a key part of culture, and these models distinguish members of a group from the members of another group. Sharifirad and Ataei (2012) note that these shared assumptions are a central part to several definitions. De Jong (2009) states that definitions commonly include values and trends; refer to a group; and include aspects that last through generational changes. These authors highlight that culture concerns how members of a group perceive and think about events, the assumptions they share and the core values that they possess.

Theories on organizational culture have come into focus as a counterweight to structural schools of thought to explain the behavior of individuals in organizations. A common definition of organizational culture is "*the way we do things around here*" (Schein, 1999). However, that definition gives little insight into which aspects of culture that should be studied in order to understand the concept. Schein (1990) investigated organizational culture and described it as:

  a. a pattern of basic assumptions, invented, discovered, or developed by a given group,
  b. as it learns to cope with its problems of external adaption and internal integration,
  c. that has worked well enough to be considered valid and, therefore,
  d. is to be taught to new members as the
  e. correct way to perceive, think, and feel in relation to those problems.

Furthermore, Schein (1990) argues that three distinct levels need to be considered when analyzing organizational culture: *observable artifacts* such as physical layout, dress code, statements of philosophy; *values, norms, philosophy and ideology;* and *basic underlying assumptions* which for example govern how the organization relates to its environment. The main difference between these levels is the visibility of culture at each level. Artifacts are observable objects and structures, while values and norms influence the behavior and interaction of organizational members. Values and norms are less observable than artifacts and may be implicit. The least visible level of culture is underlying assumptions. Assumptions are beliefs that are taken for granted, shared mental models and habits which are part of the organizational fabric. As a result, assumptions are more difficult to study.

Some definitions include the expressed result of organizational culture which manifests itself in the behavior and characteristics of organizational members. Dobni (2008, p. 544) proposes that "*culture in organizations is defined as the deeply seated (and often subconscious) values and beliefs shared by employees at all levels, and it is manifested in the characteristics (call them traits) of the organization. It epitomizes the expressive character of employees and it is*

19

communicated and reinforced through symbolism, feelings, relationships, language, behaviors, physical settings, artifacts, and the like." Barney (1986) claims that culture defines the way in which a firm conducts its business. Taken this way, culture constitutes a type of boundary condition for the space of possible actions that an organization can undertake. Barney (1986) further claims that the structure and strategy of an organization is a manifestation of its culture. Understanding the organizational culture therefore becomes highly important for understanding the actions of the organization as well as its choice of strategy and structure.

Many of the definitions of organizational culture are broad and include both behavior and underlying factors, such as values, norms and assumptions (Hofstede, 1990). Consequently, the concept may be difficult to study since the number of values that could be used to describe organizational cultures may be infinite and is only dependent on the researcher's ability to come up with new domains (Denison, 1996). According to Denison (1996) early research on organizational culture predominantly used qualitative approaches in contrast to the research on organizational climate which was dominated by quantitative approaches such as large surveys. Research on culture typically involves field observations and emphasizes the organizational context and the point of view of the object of study. However, as cultural research evolved, it has come to resemble climate research by increasingly using survey data and incorporating the manifestation of culture as well as underlying values and shared assumptions (Denison, 1996). Thus, cultural research today exists on multiple levels, from manifestations of culture to deep-seated beliefs and assumptions that guide organizational behavior.

3.6 Organizational culture and effectiveness

One area of research has examined the relation between organizational culture and specific organizational outcomes. Denison and Mishra (1995) examined the relation between organizational culture and effectiveness. Drawing on Schein's organizational culture framework and Quinn and Rohrbaugh's (1981) competing values framework, a model for linking organizational culture and effectiveness is developed. The writers focus on organizational practices rather than deeply held organizational beliefs and assumptions. The model focuses on generalizations about culture on the level of values and is rooted in research on how culture influences organizational performance (Denison, 2000).

The four cultural traits identified by Denison (2000) each comprise three dimensions, see *Table 4*. Adaptability refers to the organization's ability to change in response to new conditions in the business environment. It consists of creating change, customer focus and organizational learning. An adaptable organization is able to create change by responding quickly to changing customer needs and to quickly pick up and understand trends. A customer focus is necessary to understand customer needs as well as future needs (Denison, 2000). Through organizational learning the firm picks up signals in its environment to gain knowledge and develop organizational capabilities.

Consistency refers to the values and systems that influence firm culture. Previous research has shown that a high level of integration leads organizations to become effective (Denison, 2000). Highly coordinated and integrated organizations create strong cultures that influence behavior in the organization. The dimensions of consistency are core values, agreement, and coordination and integration. Core values are shared by organizational members and provide a clear identity and expectations. Agreement concerns the ability to agree on crucial issues and to cope with differences of opinion. A coordinated and integrated firm is able to easily work across intra-firm boundaries to achieve its goals.

Involvement in the organization is about empowering employees and to create a commitment to work (Denison, 2000). Human development is emphasized and the individual's work is clearly connected to the goals of the organization. The dimensions of involvement are empowerment, team orientation and capability development. Empowered individuals have authority and take initiatives and feel a sense of ownership and responsibility to the organization.

According to Denison (2000), mission involves having a clear sense of purpose and direction as well as a vision for the future of the organization. The firm's mission also needs to be long-term as changes to the mission will require the organization to change its strategy, structure and culture accordingly. Strategic intent and direction, goals and objectives and a shared vision are important components of a firm's mission.

Denison's framework takes an overall perspective on firm culture and can be used as a diagnostic tool when undertaking organizational change projects or diagnosing organizational culture. However, it should not be used as the only indication of the culture in a firm. Denison (2000) notes that taken in isolation, the framework does not tell the whole story of an organization's culture, but needs to be complemented with a deeper understanding. Depth of analysis is important for giving meaning and insight to the findings from the survey.

The model has been applied on firms in several parts of the world, such as Asia, Russia and the US. In a study done on Asian firms it was concluded that mission, consistency, adaptability and involvement are the best predictors for organizational effectiveness (Denison, Haaland, & Goelzer, 2004). It was also concluded that mission and consistency are the best predictors of profitability. Adaptability and mission were found to be the best predictors for sales growth while involvement and adaptability were the best predictors for innovation.

Table 4 Denison's organizational culture model. Inspired by: Casida and Pinto-Zipp (2008).

Cultural trait	Dimensions	Definition
Adaptability	Creating Change Customer Focus Organizational Learning	Refers to the organization's ability to translate the demands of the business environment into action.
Consistency	Core Values Agreement Coordination and Integration	The values and systems that are the basis of a strong culture. It provides a central source of integration, coordination, and control.
Involvement	Empowerment Team orientation Capability development	Characteristic of a "highly involved" culture, in which employee involvement is strongly encouraged and creates a sense of ownership and responsibility
Mission	Strategic Direction & Intent Goals and Objectives Vision	Reflects the organization's ability to define a meaningful long-term direction that provides employees with a sense of focus and a common vision of the future.

3.7 Organizational culture and innovation

As previously concluded, there are different types of innovations, predominantly classified on the scale of incremental and radical innovations. Several scholars have argued that these types require different management structures and processes (e.g. Assink, 2006; McLaughlin et al., 2008; Tushman & O Reilly, 1996). Having a culture that supports innovation is an important enabler of innovative output, but the culture may also act as a barrier to innovation – especially in mature firms (McLaughlin et al., 2008). Incumbent firms are typically well organized to manage incremental change, but fail at coping successfully with disruptive innovations (Bower & Christensen, 1995). Firms that focus on developing incremental innovation may therefore need to challenge the existing logic of the organization in order to succeed in developing more radical innovation. Indeed, it has been argued that radical innovation needs another type of management processes less defined and with another type of culture than incremental innovation (McLaughlin et al., 2008). *Table 5* illustrates the archetypes of incremental and radical innovation and contrasts the archetypes along multiple dimensions.

Table 5 Archetypes of organization culture for incremental and radical innovation. Source: McLaughlin et al. (2008)

	Incremental	*Radical*
Procedures	Formalized	Contingent
	Centralized	Decentralized
	Systematic	Loosely structured
Structure	Functional	Facilitating knowledge
	Efficiency oriented	gathering
		Supporting risk taking and
		orientation
People	Homogenous	Heterogeneous
	Older and experienced	Younger and entrepreneurial
		Technical
		Questioning
Aspects of the organization	Mature	Entrepreneurial
	High inertia	Focus on discovery
	Focus on efficiency	Individual cooperation
	Focus on team-working	Frame-breaking improvement
	Continuous improvement	
Focus	Cost reduction	New methods and
	Feature addition	technologies
	Efficiency improvement	Experimentation
		New ideas
		Creation
Product/technologies	Mostly existing	Mostly new
Management	Exploitation	Exploration

Organizational culture may be difficult to observe and recognize to an outsider, which is likely a result of the fact that it is concerned with *assumptions*. This is likely why some authors have concluded that - contrary the view of McLaughlin et al. (2008) – that there are few cultural differences between organizations set up for incremental or radical innovation and that a culture for innovation will support either type of innovation (Büschgens et al., 2013). This increases the need to look at an overall innovation culture in the organization, since innovation is an important factor for today's organizations (Assink, 2006). Some attempts have been made to measure innovation culture (e.g. Dobni, 2008), to gain an understanding of what type of culture that is most conducive to innovation and how to manage such a culture. Dobni (2008) defines innovation culture as a multi-dimensional context that comprises of four dimensions:*"the intention to be innovative, the infrastructure to support innovation, operational level behaviors necessary to influence a market and value orientation, and the environment to implement*

innovation.” (Dobni, 2008, p. 540). The organizational culture acts as the element that ties the different dimensions of innovation together and the multi-dimensional approach recognizes that innovation may originate from several different activities in the firm (Dobni, 2008). The four dimensions are shown in *Figure 5* below.
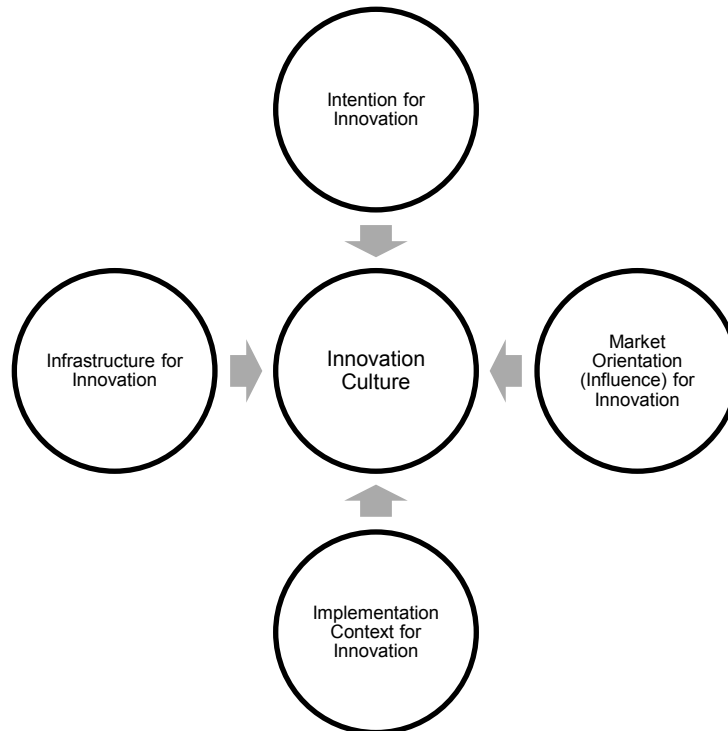
Figure 5 Four dimensions of innovation culture. Inspired by: Dobni (2008).

One reason for the focus on culture in organizational literature is likely be due to its impact on organizational and individual behavior. Behaviors are affected by culture and an innovation culture enables and values for example teamwork, creativity and trust at the same time as it removes barriers to be innovative (Dobni, 2008). Dobni (2008) used 86 scale items (practices) to measure innovation culture and applied a Likert scale to each item to indicate how well the practice was adopted in the organization. Through exploratory factor analysis seven factors were identified and 70 items were represented. The seven factors presented as representative to measure innovation culture are: innovation propensity; organizational constituency, organizational learning; creativity and empowerment; market orientation; value orientation; and implementation context (Dobni, 2008). As previously stated, organizational culture may be difficult to manage because it is difficult to grasp. Creating a framework of innovation culture therefore helps managers to identify where to start the process of culture development.

4 Proposing a framework for innovation culture

In the following chapter, an innovation culture framework is proposed. The framework presented in this chapter is based on the literature study and a synthesis of the essential parts of innovation culture described in previous literature. In chapter 6 a revised framework is presented, based on the framework presented here.

4.1 Developing the framework

The outline of the theoretically based framework (*Figure 6*) is largely based on the work of Dobni (2008), who proposes an innovation culture framework consisting of four dimensions and seven factors. The framework proposed in this chapter was developed from Dobni's factors, but the framework was revised as discussed in section 2.3.2. The revision of the framework was done to incorporate additional literature that was considered relevant when describing the innovation culture concept.

The framework proposed here has three main differences from that proposed by Dobni. First, entrepreneurship in organizations (also known as intrapreneurship or internal venturing) is added as an important dimension for an innovation culture and is grouped together with creativity. Entrepreneurship was included since it has been identified as an important factor for innovation by several authors (see section 4.3.2). Second, individual and organizational motivation is proposed as important for an innovation culture. Third, value orientation and implementation context are omitted as a separate dimensions. Value orientation is instead incorporated into market orientation. Finally, Dobni's factors of implementation context and innovation propensity are grouped together to form the dimension innovation readiness.
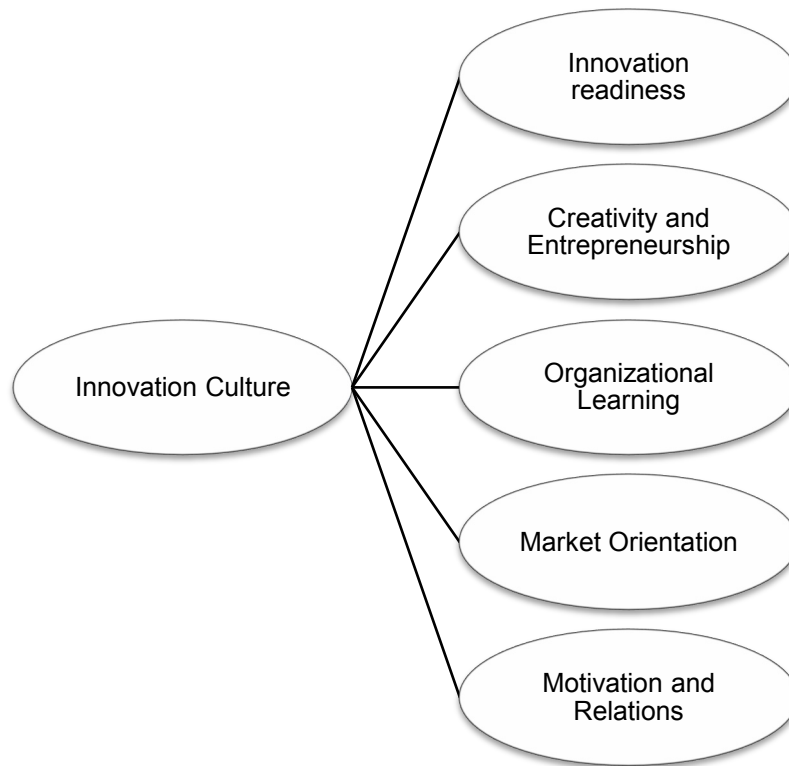
Figure 6 The five proposed dimensions of an innovation culture. Source: Authors.

4.2 Innovation readiness

Innovation readiness refers to the organization's level of preparation to come up with innovative ideas and to ensure that those are realized by the organization. Innovation readiness comprises two main parts; the organization's propensity for innovation and the implementation context. Innovation propensity concerns how well the organization has incorporated innovation into its goals, vision, mission and business model and whether or not innovation is regarded as a strategic focus for the firm (Dobni, 2008). The implementation context relates to how the firm implements different types of innovations, that is, if incremental innovations are implemented in the same way as disruptive innovations. Having an flexible implementation context for innovation is important since different types of innovations require radically different management of processes and structures compared to the firm's traditional business (Kanter, 1988; Tushman & O Reilly, 1996). To have a high level of innovation readiness, a firm therefore needs to have both a high propensity for innovation and an implementation context which supports different types of innovations.

4.2.1 Propensity for innovation

The firm's propensity to innovate largely relates to its intention to innovate. According to Dobni (2008) the intention to innovate is a pre-requisite for an innovation culture. Organizational or strategic intent concerns the firm's ambition to achieve a desired future state or position and the active management that focuses on realizing that vision (Hamel & Prahalad, 1990). It involves

focusing on the organizational activities that will enable the firm to achieve its desired ambition, motivating people by communicating the value of the objective, adapting the objective as circumstances change and consistently letting the strategic intent guide the firm's resource allocation (Hamel & Prahalad, 1990). Firms that have incorporated innovation into their strategic intents consistently communicate the value of innovation and allocate resources in order to increase the propensity for innovation.

Kanter (1988) discusses organizational expectations - which is slightly different from strategic intent - for innovation as important for a firm's innovation process. Organizational expectations are the signals which individuals receive about what the organization expects from them and how well attempts at innovation will be received by the organization (Kanter, 1988). According to Kanter (1988) the first key issue in innovation management is to get people to pay attention to new ideas, needs and opportunities. Innovation therefore needs to be a clearly articulated goal which is reflected in the firm's strategy. One way to signal expectations for innovation is to allocate sufficient financial resources and give enough time to support innovation. Access to financial resources and time is consistent with the importance of resource allocation emphasized by Hamel and Prahalad (1990).

However, Kanter claims that resource allocation is just one part of creating organizational expectations for innovation. She states that innovators often possess a culture which pushes "change" over "tradition". Creating a culture of change explains why some firms manage to stay innovative and repeat past successes. Pride in the firm and confidence in the abilities of the organization's members also help to create a self-reinforcing cycle where pride stimulates performance, which is highly important for innovation (Kanter, 1988). Consequently, the concept of organizational expectations encompasses more factors than that of strategic intent since it emphasizes past successes as well as the firm's attitude to change (in contrast to tradition). Organizational expectations for innovation may therefore be more apt at explaining an innovation culture compared to a strategic intent. The main factors of strategic intent and organizational expectations for innovation are presented in *Table 6*.

Table 6 Related concepts and authors on propensity for innovation.

Related concepts and authors	Factors
Strategic intent (Hamel & Prahalad, 1990)	Clearly communicated and shared firm objectives
	Resource allocation guided by firm objectives
	Incorporating innovation into the firm's strategic intent
Organizational expectations for innovation (Kanter, 2000)	Creating expectations for innovation
	Emphasizing "change" over "tradition"
	Pride and confidence in the abilities of the firm

4.2.2 Implementation context

In addition to creating a culture for innovation through a clearly articulated strategic intent and incorporating innovation as a core organizational value, it is also necessary for firms to be prepared to develop and implement new ideas and initiatives. Christensen (2003) argues that incumbent firms that come up with radical new ideas often fail to commercialize them because the firms´ infrastructures only support incremental innovations of existing products. Several authors have discussed the infrastructure required for various innovation initiatives and proposed that the type of infrastructure necessary to support an innovation depends on the characteristics of the innovation; often on whether it is incremental or disruptive (Dobni, 2008; Kanter, 1988; Kotter, 2012; McLaughlin et al., 2008; Tushman & O Reilly, 1996). Therefore, the organization's infrastructure requires flexibility to support multiple types of innovation. The concepts discussed in this section are presented in *Table 7*.

Tushman and O Reilly (1996) argue for a close link between the organizational structure and firm culture. They claim that management of innovation requires different sets of organizing depending on the type of innovation. Incremental innovations can be managed by the mainstream organization which is focused on exploiting existing business opportunities. However, the mainstream organization is often unable to support the exploration and commercialization of disruptive technologies. Tushman and O Reilly (1996) claim that incremental and disruptive innovations require radically different cultures to succeed. Incremental innovations thrive in a culture focused on efficiency, low risk, high quality, and meeting the demands of current customers. Radical innovations on the other hand, require a culture characterized by risk taking, speed, flexibility and experimentation.

McLaughlin et al. (2008) discuss company infrastructure as an important determinant for a firm's possibility to innovate and distinguish between infrastructure required for incremental and radical innovations. Incremental innovation prospers when the infrastructure encourages conformance to rules and procedures with sufficient resources and benefits from a continuous improvement approach. Radical innovation requires encouragement of risk taking and often requires somewhat restricted resources to inspire creativity (McLaughlin et al., 2008). Having a product champion at a high level is also beneficial for radical innovations. The main characteristics emphasized by McLaughlin et al. (2008) are access to resources, level of formalization and level of centralization.

Tushman and O Reilly (1996) and McLaughlin et al. (2008) express the need for managing incremental and radical innovation in different types of organizations. More recently, Kotter (2012) argued that innovative firms should combine the traditional hierarchy with an agile network structure in order to become more innovative. The hierarchical structure provides high efficiency and focuses on the mainstream business while the network structure uses a radically different logic. The purpose of a network structure is to assess the mainstream business and to provide opportunities to quickly and creatively react to events that require the firm to take action, such as external changes (Kotter, 2012). Thus, the network structure provides the firm with the

opportunity to be both effective and efficient without maintaining separate organizations for radical innovation initiatives.

Table 7 Related concepts and authors on implementation context.

Related concepts and authors	Factors
The ambidextrous organization (Tushman and O'Reilly, 1996)	Risk-taking Speed Flexibility Experimentation
Archetypes for innovation (McLaughlin et al., 2008)	Restricted resources High level product champions Low levels of centralization and formalization
Network structure for innovation (Kotter, 2012)	Agile network structure to support innovation

4.3 Creativity and entrepreneurship

Both creativity and entrepreneurship have been recognized as important factors for innovation (see e.g. (Amabile, 1996; Amabile & Kramer, 2011; Higgins, 1995; O'Connor, 2006)). Amabile (1996) defines creativity as the production of new and useful ideas in any domain. However, creativity does not equal innovation. The difference is that innovation is the successful implementation of creative ideas within an organization (Amabile, 1996). Several studies have identified entrepreneurship as crucial in order to implement new creative ideas (Börjesson et al., 2014; O'Connor, 2006; Tellis, Prabhu, & Chandy, 2009). Both creativity and entrepreneurship are therefore important parts of an innovation culture.

4.3.1 Individual and organizational creativity

Amabile (1996) discusses creativity on two levels; the individual and the organizational level, outlined in *Table 8*. On the individual level, it is proposed that creativity results from expertise, creativity skills and task motivation. Expertise is the basis for all creative work and concerns factors such as technical and factual knowledge. However, expertise alone is not sufficient for creativity; there is also a need for "something extra". Creative thinking skills relate to individual characteristics such as self-discipline, independence and perseverance. Together, expertise and creative thinking determine what an individual is capable of doing; however, what she will actually do is determined by her task motivation. Task motivation consists of intrinsic and extrinsic motivation.

On the organizational level, the factors that influence creativity are management practices, organizational motivation and resources (Amabile, 1996). Management practices relate to the level of autonomy given to employees, how challenging the tasks are and constructing efficient

work groups of complementary skills and knowledge. Organizational motivation comes from placing value on creativity and innovation; a risk-orientation; a sense of pride in the organization and its purpose; as well as a having a strategy of being market leader. Resources include factors such as time, competence and funds available to an innovation project. In particular, time has been argued to be an important resource for creativity. Lawson and Samson (2001) use the term "creative time" to denote the time that some firms give employees to work on their own projects. Danneels (2008) also points out that some resource slack is important for promoting creativity.

In a later work, Amabile (1998) identifies factors that kill creativity and adopts a managerial perspective on categories which need to be managed in order to promote creativity. She claims that to manage creativity in an organization, six categories are critical to work with: challenge, freedom, resources, work-group features, supervisory encouragement, and organizational support (Amabile, 1998). These factors are largely consistent with the individual and organizational factors discussed previously, but the role of managers in promoting and encouraging creativity in the work-place is further emphasized. From Amabile's work, it appears that creativity is a multi-level phenomenon and that cultural aspects influence the level of individual and organizational creativity.

Andriopoulos (2001) elaborates on the topic of organizational creativity and claims that organizational culture is one of several determinants for creativity. He states that managing culture related to creativity is a key challenge for firms. Andriopoulos (2001) identifies five factors in an organization's culture which impact creativity. These factors are open flow of communication; risk-taking; self-initiated activity; participative safety; and trust and respect for the individual. Kanter (1988) also emphasizes open communication, since many creative ideas stem from combining different areas of expertise and from understanding and meeting customer needs. A summary of the concepts and factors discussed in this section is presented in *Table 8*.

Table 8 Related concepts and authors on creativity.

Related concepts and authors	Factors
Individual and organizational creativity (Amabile, 1996)	*Individual level*
	Expertise
	Creativity skills
	Task motivation
	Organizational level
	Management practices
	Organizational motivation
	Resources
Factors that promote creativity (Amabile, 1998)	Challenge
	Freedom
	Resources
	Work-group features
	Supervisory encouragement
	Organizational support
Determinants of organizational creativity (Andriopoulos, 2001)	Open flow of communication
	Risk-taking
	Self-initiated activity
	Participative safety and trust
	Respect for the individual

4.3.2 Entrepreneurship

Many definitions of entrepreneurship have been proposed. Notably, Schumpeter (1942) described an entrepreneur as someone who converts a new idea or invention into an innovation. More recently, entrepreneurship was described as *"the successful implementation of creative ideas to produce a new business, or a new initiative within an existing business."* (Amabile, 1996, p. 2). Entrepreneurship in existing organizations has also been addressed in previous research and has been termed internal venturing or intrapreneurship. The concepts discussed in this section are summarized in *Table 9*.

In literature focusing on intrapreneurship, individual organizational members are given a prominent position. Intrapreneurs or innovation champions, i.e. entrepreneurs who work in large organizations, can play crucial roles for the success of innovation efforts (Börjesson et al., 2014). Intrapreneurs are particularly important for promoting disruptive innovations in large

organizations (O'Connor & McDermott, 2004). In conclusion, intrapreneurs have a highly important role for promoting innovation in large firms.

However, the environment of large organizations is often not conducive to intrapreneurs. Entrepreneurial people are driven from large firms because of hierarchical structures, bureaucratic mindsets and other formalities that create an environment which does not suit them (O'Connor & McDermott, 2004). Rigidities of large organizations can therefore drive intrapreneurs away and negatively impact the innovation capability of the firm. However, large organizations also offer certain conditions that can promote intrapreneurship. According to O'Connor and McDermott (2004) large firms offer rich networks, access to skilled individuals, an abundance of new ideas and a large talent pool. In addition, financial and physical resources are less constrained compared to early ventures, and the firm's brand name and contacts can be important for gaining access to new markets, acquiring new partners and securing sources of financing.

Related to intraprenuership, several firms have promoted internal corporate venturing. According to an early description by von Hippel (1977), internal corporate venturing involves an individual or a group in an organization, who is in charge of developing an new product, bringing it to market and sustaining it through the early activities following market introduction. More recently, Antoncic and Hisrich (2001) described intrapreneurship as entrepreneurship in an existing organization, which leads to new businesses and other innovative activities such as development of new products, services, technologies, administrative techniques and strategies. von Hippel (1977) argues that internal venturing does not depend solely on the entrepreneur leading the venture, but is a concept which is applicable in a wide range of industries, on many scales, with a varying degree of responsibility and which does not require special entrepreneurial qualities. This argument implies that organizational factors also play a significant role in enabling successful intrapreneurship.

Burgelman and Välikangas (2005) examined internal corporate venturing and concluded that organizations tend to be highly cyclical in internal venture investment. The main drivers for internal venture cycles are the level of uncommitted resources and the prospect of the mainstream business (Burgelman & Välikangas, 2005). Common reason for failing efforts include early termination of venture projects, a lack of ownership and a tendency to overinvest when resources abound and suddenly terminate efforts when resources are scarce. The firm's management must therefore be resilient in venture investments, carefully manage ventures and stress their strategic importance by connecting the firm's venture efforts to its overall strategy (Burgelman & Välikangas, 2005). Consequently, success of internal ventures is impacted by cultural factors such as risk taking, but also the firm's goals and strategy.

Table 9 Related concepts and authors on intrapreneurship.

Related concepts and authors	Factors
Enablers and barriers for intrapreneurship (O'Connor & McDermott, 2004)	Rich networks
	Access to skilled individuals
	An abundance of new ideas
	Large talent pool
	Financial and physical resources
	Hierarchical structures
	Bureaucratic mindsets
	Other formalities
Common reasons for failure of internal corporate venturing (Burgelman & Välikangas, 2005)	Early termination of venture projects
	A lack of ownership
	A tendency to overinvest when resources abound and suddenly terminate efforts when resources are scarce

4.4 Organizational learning

Learning has been identified as an essential part of innovation culture in several studies. Calantone, Cavusgil, and Zhao (2002, p. 516) define learning orientation as an *"organization-wide activity of creating and using knowledge to enhance competitive advantage"*. A first step to achieve a learning orientation is to set a commitment to learning that spans the whole organization, something that is aided by having a shared vision. Calantone et al. (2002) created a framework of learning orientation and its influence on firm performance and innovation. In an empirical survey with 187 participating US firms they found that learning orientation can be constructed through the elements of: *commitment to learning*; *shared vision*; *open-mindedness*; and *intra-organizational knowledge sharing* (Calantone et al., 2002). A summary of the factors presented by Calantone et al. (2002) as well as those of other authors discussed in this section can be found in *Table 10*.

A learning orientation helps in order to create processes to share knowledge within the organization. Allowing different opinions and new ideas, that is, being open-minded helps to motivate individuals to discuss what they have learned. An empirical study by Lin (2007) showed that knowledge sharing is important to enhance the innovation capability of a firm. Mainly the factors *"enjoyment in helping others and knowledge self-efficacy"* (Lin, 2007, p. 315) were found to be significant. Knowledge sharing is thus in a sense connected to altruism, but also to a mindset of what you are capable (and not capable) of doing. An organization that wants to develop a learning orientation therefore needs to break down the barriers to share knowledge in

terms of prestige, possibly by focusing on knowledge sharing as communication rather than teaching.

Hult, Hurley, and Knight (2004, p. 431) argue that *"learning orientation occurs primarily at the culture level of the firm…"* This is illustrated in their statement that learning is an intermediary to change behaviors, values and beliefs (Hult et al., 2004). Through their empirical study they found that a learning orientation has a significant impact on firm innovativeness, which in turn affects business performance (Hult et al., 2004). Thus, having a learning orientation is not only connected to the culture of the firm, it is also an important part of staying competitive. Hurley and Hult (1998) also acknowledged that an emphasis on learning and development is associated to innovativeness. They go so far as to claim that: *"[O]rganizational learning, when viewed from a behavior change or implementation perspective, is equivalent to innovation."* (Hurley & Hult, 1998, p. 47). Since innovation is often defined in terms of value creation (Assink, 2006; Higgins, 1995) such a description of learning implies that learning has a value in itself. However, following the definition of innovation as a mechanism to adapt to changing markets (Lawson & Samson, 2001), a learning orientation could also be seen as such an effort (mechanism) similar to the statement from Hult above. In either case, learning orientation appears to be an important factor, either directly, or as an intermediary to value creation and innovation.

Both Calantone et al. (2002) and Keskin (2006) found that a learning orientation has a positive impact on firm innovativeness and that innovativeness is related to firm performance. Their perspective on learning is that the organization should value learning through an appreciation of the efforts of employees to learn. A commitment and shared purpose in the organization is achieved through the encouragement of employees to discuss and take part in decision-making. Furthermore, an interdepartmental collaboration ensures a wider knowledge spread and a common overall focus.

From a longitudinal study, Börjesson et al. (2014) state that managers need to have a learning perspective in order to develop innovation capabilities. However, a study by Dobni (2008) indicated that not only managers, but all employees should to be involved in learning, with managers offering support for learning by acting as coaches for employees in their training.

Table 10 Related concepts and authors on organizational learning.

Related concepts and authors	Factors
Learning Orientation (Calantone et al., 2002)	Organization-wide commitment to learning Shared vision Open-mindedness Intra-organizational knowledge-sharing
Knowledge donating and knowledge collecting (Lin, 2007)	Enjoyment in helping others Knowledge self-efficacy
Organizational learning (Dobni, 2008)	Organization-wide involvement in learning Management support for learning Learning related to strategy Expectation to development Time and opportunity to learn
Learning and development (Hurley & Hult, 1998)	Opportunities for individual development Counsel and guidance Career management

4.5 Market orientation

Organizational culture is impacted by the presence (or lack of) a market orientation and a firm's market orientation impacts its readiness to take action (Hurley & Hult, 1998). Indeed a *"market orientation is a source of new ideas and motivation to respond to the environment"* (Hurley & Hult, 1998, p. 52). It has to do with the organization's external connections and ability to scan for elements that may affect it. This is similar to what Danneels (2008) refer to as environmental scanning: *"[E]nvironmental scanning refers to the extent to which organization members devote their efforts to learning about events and trends in their organization's environment."* (Danneels, 2008, p. 524). Environmental scanning is viewed here as a part of having a market orientation. If an organization has a market orientation it is likely to be aware of important changes in the external environment at early stages and may then act upon those changes faster than firms that do not have a market orientation. Furthermore, market orientation may increase the likelihood to find new opportunities (Danneels, 2008). In this sense it is an antecedent to innovativeness (Hurley & Hult, 1998).

Danneels (2008) find that environmental scanning has a significant correlation with R&D competence. R&D competence was measured in items such as: the ability to find and learn about new technologies; recruiting engineers in new technical areas; and establishing new operations and manufacturing facilities (Danneels, 2008). Consequently, a market orientation helps to find and develop new technologies; however, it may also support the ability to set up new operations

and facilities, that is, to develop the organization. McLaughlin et al (2008) state that an external perspective improves the ability to innovate, in particular to achieve radical innovation. McLaughlin et al (2008) further provide two interventions regarding market orientation: *commercial focus for innovations* and *use of external sources for ideas*. The intended outcome of the first is to provide a legitimacy of the project, and the latter implies an increased awareness of new and emerging technologies (McLaughlin et al., 2008). In addition to providing new ideas, an external perspective may therefore also motivate decisions and projects.

The results of the described studies closely match the recognized definition of market orientation by Kohli and Jaworski (1990). They have a definition of market orientation including three elements: *a generation of market intelligence, dissemination of intelligence*, and *responsiveness to intelligence* (Kohli & Jaworski, 1990). Their definition states: *"[M]arket orientation is the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it."* (Kohli & Jaworski, 1990, p. 6). Consequently, a market orientation includes processes to *generate* market intelligence, that is, to allow for external scanning. Furthermore, it requires that the organization *makes use* of the external ideas (McLaughlin et al., 2008) or at least creates a readiness to take action (Hurley & Hult, 1998) to attain more value. To make use of external ideas, the organization needs to have a well-functioning middle step to share and distribute the knowledge gathered externally. Thus, an important contribution from the definition and work of Kohli and Jaworski (1990) is that a *dissemination* needs to take place in between the gathering and use of external data. This knowledge sharing needs to take place between departments both formally and informally, in fact, "hall talk" is recommended to share knowledge across the organization to employees (Kohli & Jaworski, 1990). The relation between these steps is shown in *Figure 7*.
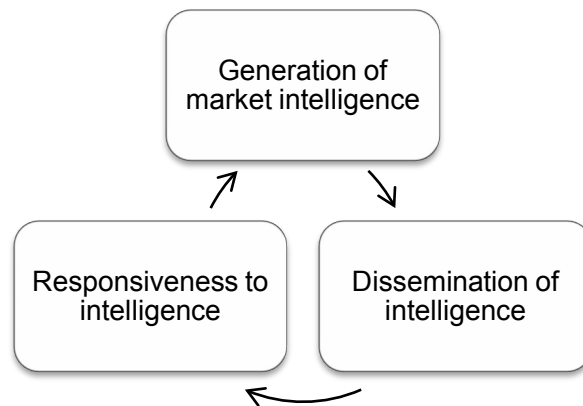
Figure 7 The elements of a market orientation in an organization. Inspired by: Kohli and Jaworski (1990).

Dobni (2008) views market orientation as a stakeholder perspective covering the whole value chain in which the organization takes part, including customers as well as competitors. Thus, there is a wide range of external sources to either collaborate with or to study in order to find

new inspiration and ideas. Dobni (2008) does also include the idea of a value orientation in his study, which is similar to market orientation, but with the purpose of having value creation for all stakeholders in mind at all stages of development. Due to the similarities of the two orientations they are both seen as part of market orientation in this study. A summary of the concepts and authors discussed above is presented in *Table 11*.

Table 11 Related concepts and authors on market orientation.

Related concepts and authors	Factors
The elements of a market orientation (Kohli & Jaworski, 1990)	Generation of market intelligence Dissemination of intelligence Responsiveness to intelligence
Commercial focus for innovation (McLaughlin et al., 2008)	Legitimacy Provide a rationale Use of external sources for new ideas
Use of external sources (McLaughlin et al., 2008)	Find ideas Inspiration to "do-different" Match to "do-better"
Value orientation (Dobni, 2008)	Interaction in the value chain Employees are aware of what the customers' value
Market orientation (Dobni, 2008)	Know how to share information Understanding the value chain Understanding the competitive environment
Scanning (Danneels, 2008)	Participate in professional association activities Active network of contacts Look for market trends

4.6 Motivation and relations

Motivation and relations is a multifaceted dimension comprising motivation, communication and collaboration. As such, it considers the aspects of internal work-life and climate of the organization created through interpersonal relationships. It is different from the other factors in that it looks at how the organization is creating a stimulating and motivating internal environment for its employees regardless of external relationships. Such an environment

enhances the ability of the organization to be innovative. The concepts and authors discussed in the text below are summarized in *Table 12*.

Hurley and Hult (1998) find that participative decision-making is positively correlated to innovativeness. Participative decision making includes having a good communication of intent and rationale between management and employees, that affected individuals are able to make their voice heard, and that open discussions and debates are forming the base to decisions (Hurley & Hult, 1998). This stands in contrast to an organization where the manager takes all decisions on his or her own, without consensus or dialogue with concerned co-workers. Doing the latter is also likely to diminish employees' feel of autonomy which in turn damages employees' work lives (Amabile & Kramer, 2011; Deci, Connell, & Ryan, 1989).

For motivation, there are some aspects that are important to consider regarding innovativeness. Erez, Gopher, and Arzi (1990) showed that goal setting has an influence on performance, and that self-set goals are best for medium to difficult tasks. They also showed that monetary rewards decreased the performance (Erez et al., 1990). Gagné and Deci (2005) similarly state that intrinsic goals are important predictors of performance. Ryan and Deci (2000) state that self-determination theory has identified competence, autonomy, and relatedness as three psychological needs that enhance motivation and mental health when fulfilled. In fact, "*[A]n organizational culture that supports autonomy in achieving clearly communicated goals will likely be more successful in terms of creativity and innovation than an organization that does not.*" (Andriopoulos, 2001, p. 237). An organizational culture that is overly controlling is likely to have a negative influence on performance and to negatively impact intrinsic motivation (Andriopoulos, 2001). Another major factor that has been shown to have negative effect on the intrinsic motivation is monetary rewards (Deci, 1971). Amabile and Kramer (2011) conclude that giving people a meaningful work is a major reason for superior performance. Furthermore, they state that supporting *everyday work progress* is the key to achieve a positive inner work life (Amabile & Kramer, 2011). Through an empirical study of 12,000 diaries from knowledge workers they found that what motivates people the most is making progress at work, both small steps and major breakthroughs (Amabile & Kramer, 2011; Amabile et al., 2010). The relation between the events at work, inner work life, and individual performance is presented in *Figure 8* below.
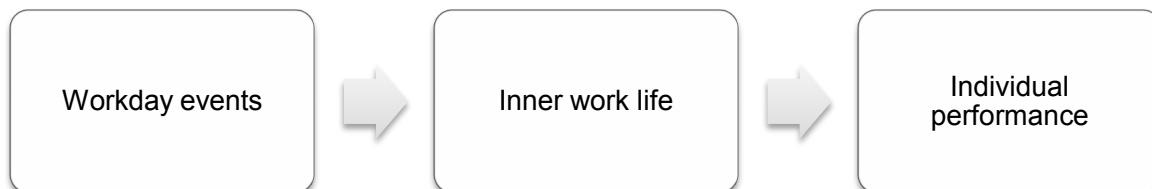
Figure 8 The inner work life has an important impact on performance. Inspired by: Amabile and Kramer (2011, p. 37).

Inner work life consists of *perceptions*, *emotions* and *motivation* which interdependently impact performance at work (Amabile & Kramer, 2011). Indeed, the well-being of employees and their perceptions of the work conditions have been shown to have a causal impact on business performance in terms of revenue, sales, customer loyalty, and profit (Harter, Schmidt, Asplund, Killham, & Agrawal, 2010). Individuals who experience positive emotions are more likely to broaden their scope to find more possibilities, whereas those who have negative feelings see a narrower set of actions (Fredrickson & Branigan, 2005). It could then be argued that individuals who see more solutions may also have better chances to be innovative. An innovation culture is therefore likely to benefit from being open-minded, supportive, positive, and collaborative.

Table 12 Related concepts and authors on motivation and relations.

Related concepts and authors	Factors
Participative decision making (Hurley & Hult, 1998)	Good communication of intent and rationale between management and employees
	Ability of affected individuals to make their voice heard
	Open discussions and debates
Setting goals (Erez et al., 1990)	Self-set goals
	Avoid extrinsic-reward systems
Self-determination (Deci et al., 1989; Deci & Ryan, 1985; Ryan & Deci, 2000)	Competence
	Autonomy
	Relatedness
Inner work life (Amabile & Kramer, 2011)	Everyday work progress
	Positive emotions

4.7 Synthesizing the framework

Based on the literature presented above, the proposed innovation culture framework is shown in *Figure 9* along with short descriptions of the dimensions that have been discussed. In *Table 13*, the dimensions are presented along with the related concepts as well as the authors which have discussed each concept.
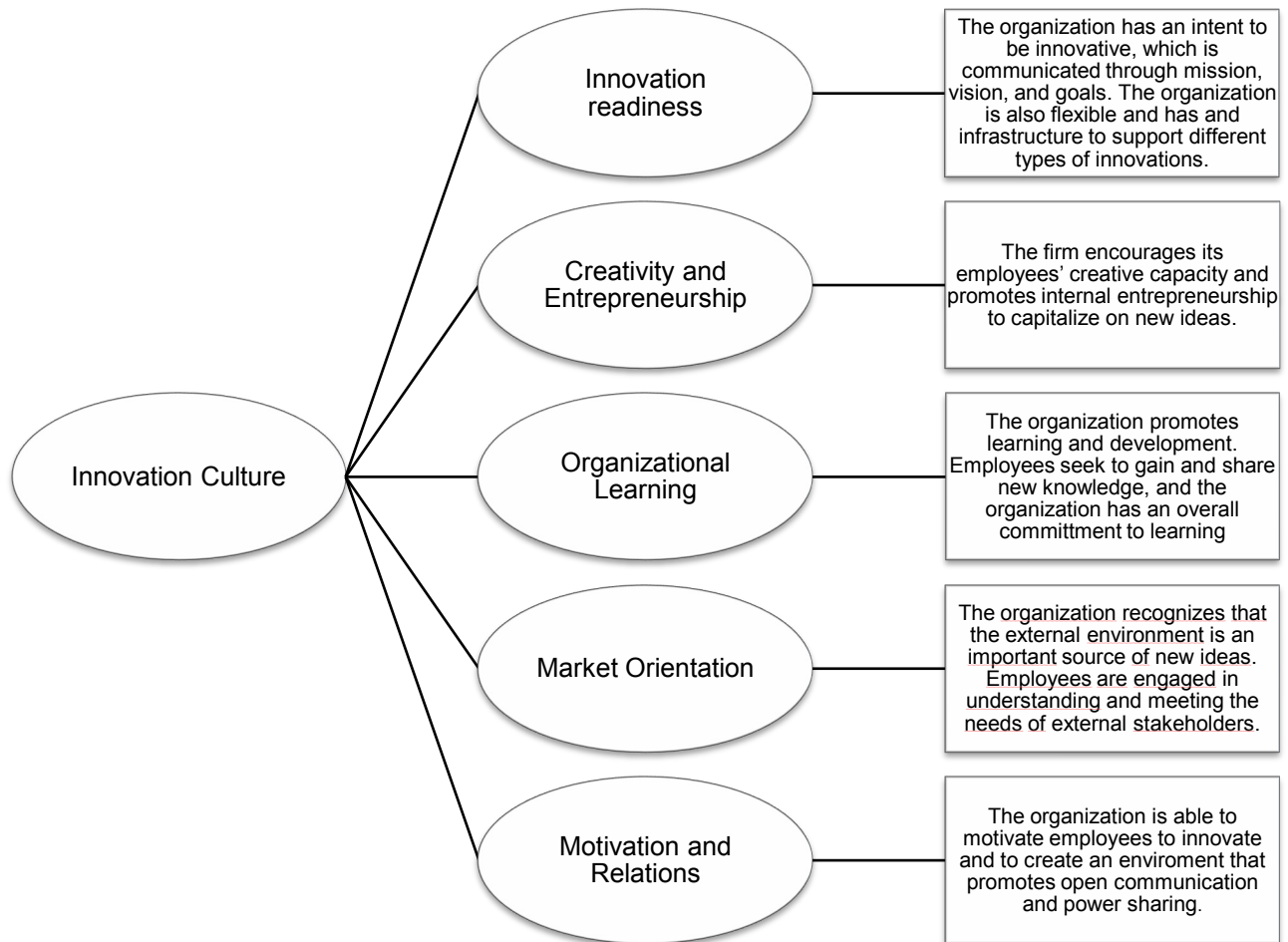
Figure 9 Proposed framework for innovation culture with explanations of the five dimensions. Source: Authors

Table 13 Dimensions of innovation culture and its related concepts and authors.

Dimension	Related concepts and authors
Innovation Readiness	Strategic intent (Hamel & Prahalad, 1990)
	Organizational expectations for innovation (Kanter, 2000)
	The ambidextrous organization (Tushman and O'Reilly, 1996)
	Archetypes for innovation (McLaughlin et al., 2008)
	Network structure for innovation (Kotter, 2012)
Creativity and Entrepreneurship	Organizational and individual creativity (Amabile, 1996, 1998; Amabile, Conti, Coon, Lazenby, & Herron, 1996)
	Culture for creativity (Andriopoulos, 2001)
	Intrapreneurship (O'Connor & McDermott, 2004; von Hippel, 1977)
	Internal corporate venturing (Burgelman & Välikangas, 2005)
Learning and Development	Learning Orientation (Calantone et al., 2002)
	Knowledge donating and knowledge collecting (Lin, 2007)
	Organizational learning (Dobni, 2008)
	Learning and development (Hurley & Hult, 1998)
Market Orientation	The elements of a market orientation (Kohli & Jaworski, 1990)
	Commercial focus for innovation (McLaughlin et al., 2008)
	Use of external sources (McLaughlin et al., 2008)
	Value orientation (Dobni, 2008)
	Market orientation (Dobni, 2008)
	Scanning (Danneels, 2008)
Motivation and Relations	Participative decision making (Hurley & Hult, 1998)
	Setting goals (Erez et al., 1990)
	Self-determination (Deci et al., 1989; Deci & Ryan, 1985; Ryan & Deci, 2000)
	Inner work life (Amabile & Kramer, 2011)

5 Empirical findings

To fulfill the purpose of the research, an interview study was performed, covering eight Swedish firms. The results of this study are presented as cases from each firm. At the end of the chapter the results are summarized, covering all dimensions of the framework proposed in chapter 4.

For each firm, different parts of the previously presented framework are highlighted, based on the focus in the different interviews. This does not mean that the firms do not work with all of the dimensions from the framework. However, the cases here focus on areas that were emphasized by the respondents. It should also be noted that the cases should not be seen as representative to the firm as a whole, but come from the perceptions of two individuals at each firm.

The cases are presented following three of the parts of culture explained by Hofstede et al. (1990), namely *Heroes*, *Values*, and *Rituals*. The first two are grouped together under a separate headline. Focus is placed on practices in the firms, discussed here as rituals, described in the five dimensions of the framework presented in chapter 4.

5.1 ABB

ABB is a multi-national engineering company headquartered in Switzerland. It was formed from the merger of the Swedish company ASEA and the Swiss company Brown, Boveri & Cie. The company employs around 148 000 people world-wide with revenues in excess of USD 40 billion (ABB, 2014). The interviews at ABB were conducted at one of the firm's divisions in Sweden, which manufactures and sells power technology to large business customers.

Heroes and values

At ABB, different heroes were discussed in R&D and sales & marketing. In R&D, the heroes were identified as individuals who come up with many ideas and are highly creative, but also as dedicated project managers who ensure that the ideas are realized. In sales and marketing, leaders who embody ABB values were considered to be organizational heroes. It was emphasized that heroes need to set good examples and be role models for behavior. The respondent expressed that over the last ten years, leaders in the organization had become significantly better at setting good examples and at communicating the values that are important in the organization.

In terms of values, a willingness to "do business" and in particular new business was described as an important value. Both respondents strongly emphasized safety as a key value, as well as a high level of involvement from employees. Drive and passion were considered as important values and both respondents discussed safety and integrity. To communicate the commitment to safety and integrity, a code of conduct is signed every year by employees where they confirm that they understand the rules for health and safety. In sales and marketing, integrity was

exemplified as having a good understanding of the rules in bidding processes and carefully making sure that the rules are followed.

Rituals

In the dimension of *innovation readiness*, the responding division at ABB described that for their product category, innovation was not an explicit goal, but viewed as instrumental in order to ensure that the firm had leading products and technologies in their industry. A key aspect to offering leading products in the industry is to provide a high level of reliability of the products. Innovative products need to be both technically innovative and offer the same high level of reliability as more established products. The firm therefore has to ensure that these two objectives are balanced.

At ABB there is also a close connection between *market orientation* and *learning*. Customers regularly attend courses where they are educated in how to work with ABB's products. During these educations, they also have the opportunity to discuss issues and areas of improvements for ABB. This provides the firm with valuable customer input and a chance to learn about the problems that the customers experience. The feedback is subsequently used to improve existing products and services. In market orientation, the firm has rituals for adhering to rules and to ensure integrity. It was described that in cases where mistakes are made in relation to the rules, leaders and employees openly discuss what has gone wrong and how this can be better dealt with in the future.

5.2 Alfa Laval

Alfa Laval is a world leading developer of heat transfer, separation and fluid handling technologies. The company has a tradition in the field lasting more than 130 years. Alfa Laval has about 16 000 employees and a turnover of nearly 30 billion SEK (Alfa Laval, 2014). The interviews were conducted at the headquarters in Lund, Sweden. A marketing engineer as well as an R&D manager in early development but also responsible for innovation processes, were interviewed. The unit that was visited develops heat exchangers and represents about half of the overall turnover.

Heroes and Values

Alfa Laval described that an important value for R&D was to be open to taking risks and not immediately view an unsuccessful project as a failure. According to one respondent: *"When we conduct projects we do not fail, we learn. You fail when you make the same mistake several times. You shouldn't do that. But to not succeed with the initial target of a project, that is not a failure."* One respondent further stated that an important value is to not control or measure too much. *"The only reason to measure is to control conduct, behavior. That's when you should measure. Otherwise you'll just get what you measure."* The emphasis on low control also meant that the firm valued experimentation and giving autonomy to individuals.

Rituals

In the dimension of *innovation readiness* Alfa Laval separates their development into several phases. First, there is technology development or conceptual development – which they refer to as early development. In this phase the most uncertain research is performed and new concepts and ideas are tested to reduce the technological uncertainty. The next phase is called new product development, NPD, which introduces new products. When that stage is reached the budget and time targets should be reached 95-97 % of the times. In this phase, there is a lot less risk than in the first. Furthermore, there is a parallel department which makes adjustments to already existing products, EPD, such as adapting product designs for certain markets. Since EPD has much smaller projects compared to NPD, the first has around 10-20 times as many projects as the latter. The difference between the development stages is the level of risk and time to market a certain product or technology has before it is ready to launch. Indeed, one of the respondents stated that if 50 % of their projects in the first stage are successful – they do not take enough risk.

Earlier, all product development was conducted in one phase which could start from any idea which often led to poor results and unhappy customers because products could not be delivered on time. Alfa Laval realized that you need to "loop" a project, i.e. iterate the idea or the prototype several times. These changes should preferably be made early when the cost of failure or change is a lot smaller than if there are changes in a product which is close to being released at the market. The phasing of development therefore enables a culture where there is opportunity to experiment and take more risk.

Irrespective of the type of project, the firm emphasized that it ensures *market orientation* by always connecting innovation to customer value. The firm uses a portfolio of activities that is sorted based on level of risk and level of potential customer value. Value can be measured as being both strategic and relating to market/product. In the end, there is a lot of gut feeling that governs which project to focus on or not. Market uncertainty is reduced through talking to customers. Indeed, customer visits are made from both marketing and R&D for various reasons: *"You need to go out… Because it is in the companies and the market where the input is, it is very valuable."* The respondents expressed that the firm has regular discussions with their most important segments, and some segments are often leading for certain products. Decisions of what to focus on are a mix on internal knowledge and customer discussions.

In *organizational learning*, it is considered important to be able to reach competent people through informal and formal network. Both internal and external networks are used to find and discuss new knowledge. Internally, workshops are another way to find both people and ideas and are therefore carried out in the company. Externally, joint development with startups or firms who work similarly to Alfa is a strategy to find new competence. To gain new knowledge as an employee there are also various courses offered to take – ranging from product knowledge to price setting.

5.3 Assa Abloy

Assa Abloy is a world-leading lock manufacturer and is the world's largest manufacturer by sales volume. It has revenues of around SEK 47 billion and employs over 42,000 people worldwide (Assa Abloy, 2014). The interviews at the firm were conducted with one representative from a centralized R&D unit and one representative from the Swedish sales organization.

Heroes and Values

The overall culture in the firm is described as open, forgiving and concerned with raising any problems that the firm may encounter. It was also expressed that the firm maintains and places a high value on an entrepreneurial climate, despite of its size. The entrepreneurial climate is enabled by the fact that that the firm is highly decentralized and divided in around 200 smaller firms where money is quite limited, which forces employees to be smart about their choices. The culture was also described as highly product-focused, with chief architects as important organizational heroes. In particular, the architects that design new products and identify product specifications for successful products were considered to be innovation heroes.

Rituals

One of the most striking aspects of the *innovation readiness* in the firm's culture is the extent to which innovation is emphasized in the firm's vision. Its vision is:

- "To be the world-leading, most successful and *innovative* supplier of total door opening solutions,
- to lead in *innovation* and offer well-designed, safe, secure and sustainable solutions that create added value for our customers, and
- to be an attractive company to work for" [italics added] (Assa Abloy, 2014, p. 8)

According to the respondents, the fact that firm is decentralized results in that knowledge is dispersed. To better utilize the knowledge present in the firm, a centralized R&D department has been introduced, called shared technologies. This department develops software that goes in to the firm's locking solutions. The core innovation processes are; product management, pre-product innovation, new product innovation and continuous innovation. These phases reflect a product's time phases, with pre-product as the early research phases before committing to a project; new product focuses on development of products, services and solutions; and continuous product innovation is concerned with developing products that are already on the market. The innovation processes are structured differently; for example new product innovation uses scrum and follows a stage-gate process with pre-defined decision criteria for each gate. The gates for pre-product innovation are designed to allow for a more creative and open work in the early stages of development.

To promote *creativity* in R&D, the firm organizes innovation days in its R&D department twice a year. Innovation days are 1.5 days long events which employees can dedicate to idea

generation and learning. Overall, too rigid processes are considered a risk when managing creativity and the days are therefore partly unstructured and teams are formed independently. During innovation days, experts in areas such as patenting are available to answer questions and help guide and support the idea generation process. Innovation days have been arranged for just over a year's time and one challenge with the events is to properly take care of the ideas that are generated.

For the sales and marketing organization, *creativity and learning* are arranged in another way. Significant amount of learning is focused on new products and to promote sales efforts of those products. The strong emphasis on selling new products is also reflected in the firm's choice of using "share of new products as a percentage of total sales" as a key metric. The firm aims to have 25% of its sales coming from products introduced in the last three years.

Market orientation is promoted through so called "voice of the customer"-programs conducted by the sales organization in collaboration with R&D. The programs have an objective that is specified by R&D and specifically targeted customer investigation is conducted rather than a general investigation. The programs involve customer interviews conducted by sales employees who subsequently communicate the findings back to R&D. The programs are considered to give a good understanding for customer needs, but R&D expresses that market orientation can be improved. Sales and marketing describe R&D as highly receptive to the results generated from the programs, but state that it is more difficult to get R&D's attention for customer preferences that do not fit into the programs.

5.4 Atlas Copco

The product portfolio of Atlas Copco ranges from mining tools, industry tools and pneumatic tools to assembly systems. In addition, the firm offers financing services and other services. Atlas Copco has a widespread sales organization in more than 80 countries reaching more than 170 markets. Atlas Copco has a turn-over of 84 billion SEK and more than 40 000 employees (Atlas Copco, 2014). One of the interviews was held at the headquarters is located in Stockholm, Sweden, and on interview was conducted over the phone.

Heroes and Values

The organizational heroes at Atlas Copco were described as entrepreneurs who take initiatives to create new successful products. However, in recent years, the role of heroes has shifted more to leaders who facilitate innovation, rather than strong entrepreneurs or product champions. Atlas Copco includes innovation as one of their three core values: interaction, commitment and innovation. The culture is oriented towards entrepreneurship. They look for creative personnel, but they are also able to keep entrepreneurial people since they allow employees to try and fail. Furthermore, people are described as highly engaged and participative. There is always time to help another employee or to guide them to the right connection.

Rituals

To promote *market orientation,* Atlas Copco works with a process known as value based product development, which is focused on customer needs. Atlas Copco tries to make sure that each member of the firm is aware of *who* the customer is and what they *need*. Atlas Copco has a strong focus on making sure that everyone is working together across departments. Marketing and R&D therefore work together on collecting customer data so that they are able to identify and fulfill the needs of the customer: *"It must be everyone's responsibility to work with innovation!"* Indeed, Atlas Copco is striving to create an engaged environment where many rather than a few have full insights and shared control over the product and are able to propose and act upon new ideas.

A tool they use to understand the customer is known as voice of the customer. It is a systematic way of interviewing customers and to ask them to state their needs and rank them. Through collecting needs from several customers a database can be set up. From this statistics can help guide decisions and make sure to prioritize between single needs and what a larger group of customers regards as valuable. Other input to guide the priorities are trends in the environment.

To allow *organizational learning* and knowledge development, the engineers have about 20 % of their time dedicated to technical development (long term development) within the line, while 80 % of the time is connected to projects. Usually the developer takes part of several stages of the project so that knowledge is kept and shared through different stages. An important factor is that planning is made in groups, including deliverers and stakeholders. Deliverables within the projects are shared responsibilities which force the teams to collaborate to push knowledge forward and reach the goals. Decisions are expected to be made by those with the best knowledge in the field, rather than by superiors or team leaders.

Atlas Copco also looks for new knowledge external to the firm through scanning for potential firms to acquire and thus gain new competence. As the firm is largely decentralized the focus of acquisitions is to broaden the competencies, rather than to develop an area of expertise, so as to avoid the risk of internal competition.

5.5 Ericsson

Ericsson is a world-leading provider of communications technology and services, with around one third of market in the mobile network infrastructure market. Their four business areas are networks, services, modems, and support. Total sales volume amounts to SEK 228 billion and the firm has around 114,000 employees (Ericsson, 2014). One interview was conducted in one of the firm's software development units and the other was held over the phone with a sales unit.

Heroes and Values

One of the respondents at Ericsson explained that the CEO is seen as a hero to the organization. He helps to communicate their vision of what Ericsson call *"the networked society"* which

includes the idea of 50 billion connected devices in 2020. By inspiring talks directed both internally and externally he helps to keep the organization staying innovative by motivating employees. The core values of Ericsson are known as respect, professionalism and perseverance and the culture is described to include freedom and autonomy (Ericsson, 2014). In order to be innovative one of the respondents expressed that they ask the questions *"how can we contribute?"* and then strive to *"put the right teams together."*

Rituals

Related to *innovation readiness*, Ericsson has a strategy to be a technology and service leader and in its vision it describes innovation as a way to achieve its goal of being the prime driver in an all-communicating world. One respondent expressed that Ericsson has been a technology leader for a long time and that it therefore excels at product innovation. Other types of innovations, such as new ways of working were described as much more difficult to succeed in. This was exemplified by the R&D unit which had dedicated 1.5 hours each Friday to work on new initiatives during four years time. However, the initiative had to be termed as an "improvement initiative" in order not to raise questions about who would ultimately pay for the time spent. Instead of specifically measuring each initiative, the manager described that he kept track of the initiatives that the unit had worked on; the learning outcomes they had led to; as well as relying on a gut feeling that they were going in the right direction.

In the same unit, *creativity* was promoted in the innovation projects which were undertaken. The projects were eight weeks long (i.e. eight 1.5 hours sessions) and the first two sessions were dedicated to coming up with new ideas which were then explored during the next six sessions. Teams formed based on individual preference, where people were free to choose to work on the idea which they found most interesting. The only requirement for conducting a project was that it needed at least two project members. In that way, ideas that were only interesting to one person were screened away and since no one worked alone, knowledge was transferred between team members. The innovation initiatives were therefore also a way to promote learning and knowledge sharing between team members.

The *market orientation* of the responding R&D manager was impacted by the fact that it mainly focused on internal customers at Ericsson. As a result, it could work closely with the internal customer and iterate quickly by showing deliverables each week. For products with external customers, it relied on specifications from Ericsson's marketing department. It was considered a large challenge to properly understand and prioritize customer specifications to give the customer the most important things and get the product just right without spending efforts on features that were unnecessary. The respondent from the sales department stated that they help their customers to develop their businesses through workshops where they co-operate to find new applications of the technologies, products, and services that Ericsson provides.

Until recently, employees at one of the interviewed departments had both a fixed and a variable income to increase *motivation*. However, the variable part was recently removed since it did not give the intended results. The manager instead emphasized the importance of motivating employees based on individual preference. The most important motivator was considered to be recognition and to properly recognize the efforts of individuals who had done important contributions. The manager also expressed that dedicated time for innovation projects was important to motivation. If it had been voluntary, few would likely have taken the time as they would be caught up in their day-to-day tasks.

5.6 Sandvik

Sandvik offers products and services in the areas of materials technology, mining, tooling and construction. Sandvik represents a global group with about 47 000 employees, turn-over of 87 billion SEK and sales in more than 130 countries worldwide (Sandvik, 2014). The interviews were held with one representative for the marketing department and one representative for R&D at the business unit Sandvik Coromant.

Heroes and Values

Respondents described that one of the founders, Göran Fredrik Göransson, is seen as a hero and a symbol for innovation to the employees in Sandvik. He represents the values of the company and people are reminded of him through competitions and symbols such as pictures in the halls of the firm. The culture is generally seen as including a sense of pride for the company. There is a helpful climate where you try to find a suitable development for the employees, promote job-rotation and take care of each other. Other values and mind-sets of the organization are *"that we are never satisfied, humble, close to the customers, and professional."* The company strives to incorporate innovation as a visible value and a way to think. Indeed, it is part of its four core values: customer focus; passion to win; fair play; and innovation. The respondents stated that innovation has always been deeply rooted in the firm, but it is nowadays also an explicit goal.

Rituals

An interesting aspect of Sandvik's innovation efforts is that they work extensively with *motivation*, for example they have several internal prizes to motivate co-workers; one of which is called the innovation prize. The respondents argue that being awarded the prizes is very honorable and employees feel proud just to get nominated. The prize is often awarded to product development, but it can also for example, be given to someone who has developed a new enterprise system at the IT-department. The prizes help to motivate and keep a culture of being proud of their products. The competitions are however also a way to incorporate the vision of innovation as a cultural pillar in the company.

At Sandvik there is a generally a lot of team work with impacts *relations*. A part of this is to find each others' strengths within a department, but there is also collaboration cross-functionally. *"Especially in the beginning of the projects [we work cross-functionally], when we set up idea*

workshops and so on. We try to engage representatives from different parts of the company." These mixes range from marketing to production to development. One respondent further argue that it is important to have the right person at the right place. Some people like to come up with ideas and there are employees known as "plants". *"The people who come up with these ideas; we try not to tie them up in long term projects or activities. Rather, they are given space and are able to be a bit more flexible and may jump in and out of projects."* If anyone needs guidance or inspiration there is an idea-process to use. Otherwise, belief or gut-feeling about a product guides decisions. If the line manager, the product owner and the developer agrees that a concept has customer value and fits the product plan a development decision is taken. The amount of time that an individual spends on a project is decided from case to case depending on individual preferences.

In *market orientation,* the respondents at Sandvik stated that it is important that the products they introduce bring a customer value. Products have a long life cycle so it is important that the products are successful. The marketing department is located close to development and they are described to have close relations to R&D. Sandvik makes customer visits to understand needs and trends which come to the development department via the product owners. In collaboration with the development unit, the needs are translated into product specifications. Sandvik collaborates with and guides customers to the best manufacturing solutions early on in the customer development phases. *"[The customers] involve us already when drawing their product… We look at the complete solution together to find the best application technology."* At times, Sandvik engineers also work at the clients' work place, which enables them to further push innovation and development from a customer perspective.

The respondent from R&D describes that *organizational learning* is promoted by the fact that the development teams apply set-based engineering methods in their development of new products. These guide the presentation of results and knowledge that has been gathered in projects. Furthermore, one of the respondents points out that it must be acceptable to test and fail, as long as you learn from your mistakes.

5.7 Scania

Scania is a manufacturer of commercial vehicles, focused on heavy trucks and buses and was during the writing of this study acquired by Volkswagen. Scania has a sales and services organization in over 100 countries with revenues of around SEK 80 billion and over 40 000 employees (Scania, 2014). The interviews at Scania were conducted at the firm's headquarters in Södertälje at its central R&D unit and a sales and marketing unit.

Heroes and Values

It was described that the culture at Scania is highly influenced by its line organization and that leaders and managers in the line organization play vital roles for enabling innovation. Excellent leaders who facilitated innovation therefore act as heroes in the organization. Scania has a strong

reputation for building reliable and working trucks and buses and takes pride in delivering well-working products of the highest quality. The respondents expressed that the firm culture is characterized by a high degree of openness with a lot of passion for the products and the company. Both agreed that there is a high degree of openness to new ideas, stating that *"you're always encouraged to talk to anyone about a new idea, it's always been like that"*, and the other respondent confirming: *"we're very open to new ideas and improvements, you could basically go to the CEO and suggest improvements if you wanted to."*

Rituals

The firm has several initiatives to promote a *market orientation* and to enable employees to understand and better serve customers. One such effort is to run a logistics company that operates trucks between the firm's facilities in Europe, in order to gain a better understanding for its customers' business. The firm also operates bus lines between Stockholm and its headquarters in Södertälje, where employees are encouraged to give feedback and come up with improvements for its buses. Employees are also encouraged to get licenses to drive trucks, an option which over 50 % of its engineers has exercised. The respondents expressed that these initiatives create an understanding for the customer's problems and make employees more passionate about Scania's products. However, issues relating to market orientation were also raised, such as the physical distance between R&D and marketing (around 5 minutes by car) which meant fewer natural meeting places between R&D and marketing.

Scania has few *external motivation* mechanisms to promote innovation. Instead, the respondent at R&D expressed a belief that the *internal* desire of engineers to experiment was a sufficient motivator as long as they are given the opportunity to act on that objective. In marketing, visible progress was identified as a key factor which kept continuous improvement efforts going. Management support was also emphasized as an important factor, in particular for motivating changes to new behavior; *"when you're trying to create a momentum for change and innovativeness, in particular starting such initiatives, the bosses really need to practice what they preach."*

Entrepreneurship at Scania is influenced by the fact that managers in the line organization control resources, as opposed to having resources controlled by a project. As a result, managers need to be intrapreneurs who are prepared to take risks with new ideas and not just go for safe bets. However, the firm also has a high focus on lean, continuous improvement of processes, and reducing waste. The focus on waste reduction has also brought with it a high focus on process improvement. One respondent expressed concerns that these processes would become too rigid and focused on minimizing risk. This risk aversion could lead to *"bad ideas being viewed as waste and not just a bad idea."*, and the manager continued to say: *"But bad ideas are necessary in order to find good ideas."* The respondent expressed a concern that the firm would be run too much by pre-defined processes and not allow managers to take risks and experiment. In the long term, this was seen as a risk to the firm's innovation culture.

5.8 Volvo

Volvo Group is one of the world's leading producers of heavy vehicles. The portfolio includes trucks, buses and marine- and industry engines. The net sales of 2013 for the group amounted about SEK 273 billion. Number of employees world-wide are about 110,000 people (Volvo Group, 2014). The interviews with Volvo were held at two departments in Gothenburg.

Heroes and Values

The innovation heroes at Volvo were described as engineers who come up with smart technological solutions. For example the inventor of the three point belt was mentioned. The core values of Volvo are: quality, safety, and environmental care (Volvo Group, 2014). One of the respondents argued that Volvo has always had a culture where they talk about innovation, and that it is something that is rooted throughout the firm. However, innovation has previously been focused on motor- and power train technology and not on for example new services. The respondents described that a gradual shift is occurring, but that such a shift takes significant time. There has also been a mindset that specialists can (and should) handle their issues on their own, but the firm is striving to develop the culture focusing more on cross-functional collaborations.

Rituals

Relating to *market orientation,* Volvo has different departments specializing in market intelligence gathering and dissemination. This includes trend monitoring in various industries that may affect the Volvo group, performed in co-operation with external analyst firms. The information is shared through the intranet, webinars, workshops, seminars and meetings. The perspectives vary in the intelligence gathering processes. At stages ahead of concept development the focus may often be completely focused on technology. However, in the phase of idea and concept development there is often an aim to have close customer collaboration using concepts such as lean startup and design thinking to rapidly develop an idea and make sure that it has customer value before scaling.

On the topic of *relations*, one respondent pointed out that when technologies merge, new challenges arise, including new ways of working: "*When we see that everything converges and all types of technologies mix together […] that is when you need a cross-functional group who meets and discusses.*" Therefore there is a higher focus today on having mixed competencies working together in a team. These groups may consist of experts from different fields, and since they often work and view things in different ways it is sometimes necessary to have a facilitator in the group that understands both languages.

Volvo has a strong focus on promoting creativity and has innovation units who work to facilitate innovation efforts in the whole Volvo Group. One of their larger types of initiatives is their innovation jams. These are usually large events held a few times a year with participants from different units in Volvo ranging from 4000-7000 people during a couple of days. The jam is usually held via an IT-tool similar to a forum where the employees can state their ideas, and

comment and develop others' ideas. *"The events are very culture building, that is, the idea is that all the people in the Volvo Group should have the possibility to say more regarding strategic questions."* Besides these events, workshops are often used as a tool to be creative and to find and develop new ideas.

5.9 Summary of the empirical findings

As the case descriptions have revealed, innovation culture varies between firms as well as efforts to develop the innovation culture. As stated earlier, the case descriptions do not imply that any of the above firms do not work the dimensions left out, but the cases highlight certain initiatives.

The first dimension, innovation readiness was presented as the organization´s commitment to innovation in values and strategy as well as ways of setting up the development work. While some firms recommended certain groups to specialize in different areas of innovation, other respondents and firms thought that every employee should be involved in the innovation effort by having dedicated time for this.

Creativity and entrepreneurship was also discussed in various ways. Some hands-on initiatives were presented such as innovation jams and workshops. While creativity was often explicitly stated, entrepreneurship was explained in more subtle ways. It had to do with leaders and employees who were passionate about their products and who used their free time to work with their ideas.

Market orientation was highlighted in several different cases. Methods to gather market and customer information ranged from what was known as "voice of the customer"-programs, to initiatives that allowed the members of the organization to use the products themselves and act as their own customers.

Organizational learning was seldom described as a separate task from others – even though there were some examples made of various courses to study. Instead, learning was often connected to creativity and described as a part of the line job or part of exchanging information and learning from other departments.

Motivation was often described as something that comes when people are allowed to work freely and autonomously on their ideas. An important part of this was that leaders needed to allow employees to use some time to work with their ideas. Team work was a common way of collaborating and teams constituting of people with various competencies or mind-sets were argued to allow debates that could better spur idea development.

6 Analysis – revising the framework

In this chapter a revised innovation culture framework is presented along with success factors and barriers to develop innovation culture. The framework presented in this chapter is an updated version of the literature framework from chapter 4 and adds to that framework by incorporating findings from the empirical study. First, the revised dimensions are described and second, success factors and barriers for each dimension are presented.

6.1 Developing the framework

The revised framework presented below is based on the framework developed in chapter 4 and adapted to incorporate the findings from the empirical study. The revised framework was developed by coding the interviews and developing concepts, themes and dimensions (described in detail in section 2.4). The results from the analysis were then compared to the literature framework in order to identify gaps between the literature and the empirical findings. It should be noted that the analysis only adds findings to the literature framework; no findings from the literature are disproven or removed.

In relation to the literature framework, the revised framework has two main differences. First, creativity and learning have been grouped together into one dimension. This was done because the empirical study showed that the two were often promoted by similar practices. For example, firms that organized innovation days or events often dedicated them to both creativity and learning. Second, a new dimension for leadership and entrepreneurship has been created. This dimension incorporates entrepreneurship from the literature framework, but also reflects empirical findings which show that a general leadership that is supportive to innovation is important to an innovation culture. The revised framework is presented in *Figure 10* below.
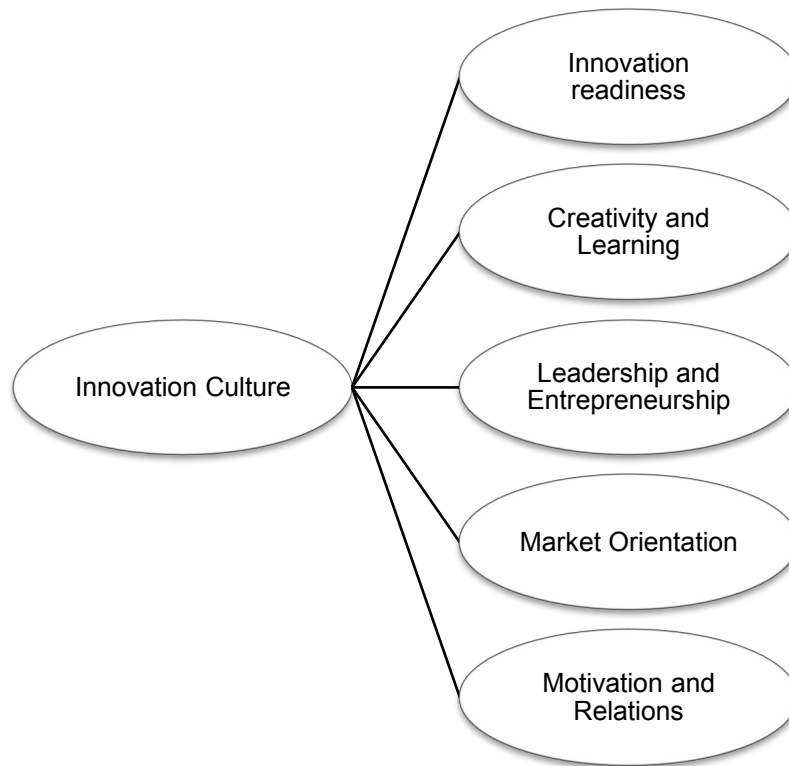
Figure 10 The revised framework in five dimensions. Source: Authors.

6.1.1 Innovation readiness

The first dimension of an innovation culture identified in the literature framework was that of innovation readiness. It was argued that innovation readiness comprises a firm's intent to innovate and its level of preparedness to realize those innovations. In existing literature concepts such as strategic intent (Hamel & Prahalad, 1990), organizational expectations for innovation (Kanter, 1988), and archetypes for incremental and radical innovation (McLaughlin et al., 2008) were identified as part of innovation readiness. By analyzing the empirical research, four main themes emerged in the interviewed firms: resources for innovation; intention for innovation; infrastructure for innovation; and organizational mindset. The themes and their relation to previous literature are summarized in *Table 14*.

Resources for innovation

The first theme that was identified is termed resources for innovation and comprises financial resources, time, and staff. Hamel and Prahalad (1990), McLaughlin et al. (2008) and Kanter (1988) all argued that resources are critical to innovation. According to Kanter (2000), resource allocation signals expectations; consequently, allocating time and money to innovation signals to organizational members that innovation is an important priority. Similarly, respondents expressed that time and money are two main determinants for achieving innovation. However, for both factors, the ideology differed as to how to best allocate the resources. For example, one firm specifically dedicated time to innovation on a weekly basis, others dedicated time on a

yearly basis for large-scale events. Most respondents expected individuals to take the time to explore possibilities for innovation in their everyday work. For financial resources, similar disagreements existed; some respondents emphasized that constrained resources encouraged innovation; while others expressed that more money would be beneficial. The empirical findings therefore confirm previous literature which claims that time and money are important resources for innovation culture.

Additionally, some findings on resources also add to previous literature. In addition to financial resources and time, the interview findings indicate that the number of people (staff) dedicated to innovation may be a constrained resource. One respondent stated: *"Getting new people is a pain. You can spend money on many other things, but the organization is very apprehensive about hiring more people"*. Furthermore, this study also found that lack of flexibility in resource allocation may be a major issue. Respondents expressed that securing resources for planned initiatives was relatively easy but that unexpected opportunities were much more difficult to fund.

Intention for innovation

The second theme which emerged from the empirical findings was intention for innovation, which consists of a firm's strategy and goals for innovation and the indicators used to guide that strategy. According to Hamel and Prahalad (1990), focusing organizational activities on a clearly communicated objective will help firms to achieve that objective. It could therefore be assumed that firms which are considered highly innovative also have innovation as an explicit strategy or goal. A number of respondents expressed that innovation is an explicit goal or core value. However, other respondents viewed innovation as a means to achieve another goal, such as being leading in a certain product category. This study therefore finds that innovation per se does not need to be a goal for innovative firms. A culture where innovation is viewed as a means to another end or as an indirect goal also appears to be conducive to innovativeness. As a result, it is reasonable to adopt a wide view of a strategy for innovation, where it does not have to be an end in itself, but may be a means to achieve another goal. This indicates that it is highly important that the organization clearly values innovation.

Related to the strategy for innovation are indictors in the form of KPI's (key performance indicators) which firms use to evaluate the success of its initiatives. The interviews indicate that KPIs are used as tools for monitoring behavior on an organizational level. For example, some of the responding firms defined "new product sales"[1] as vital performance targets. Using "new product sales" as a target guided efforts in R&D as well as in sales and marketing and had a significant impact on the innovation culture in the affected firms. The influential role played by indicators on innovation culture was not identified in the literature study and in this report it is

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[1] The share of products introduced in the last years as a percentage of total sales

therefore argued that indicators should be added as a theme to be included in innovation readiness.

Infrastructure for innovation

A significant body of literature has discussed various ways to structure and design organizations for innovation. Tushman and O Reilly (1996) argued that radical innovation needs to be managed in separate organizations and McLaughlin et al. (2008) claimed that there exists firm archetypes for radical and incremental innovation. To a large extent, respondents seem to agree with the view by McLaughlin et al. (2008) and highlight levels of formalization and centralization as important determinants for creating an innovation culture. For example, respondents expressed a concern that work with innovation was becoming too formalized, which could negatively impact the firm's innovation capability. However, none of the firms had embraced ambidexterity as proposed by Tushman and O Reilly (1996). The interviews indicate that respondents were familiar with the ambidextrous organization and in some cases were interested in organizing in that way. However, none had introduced such an organization.

Organizational mindset

Organizational mindset is used here to denote the underlying philosophy and attitude that influences the organization. It partly relates to the aspect of risk-taking as discussed by Tushman and O Reilly (1996) and also the organization's emphasis on "change" or "tradition" discussed by Kanter (1988). Mindset in relation to risk has been highlighted by respondents on two levels; both on a leadership level and an organizational level. This section concerns the organizational level and represents the tolerance to risk built into the organization's structure. It is exemplified by the level of risk and uncertainty which a firm can tolerate, for example in new product development projects. The level of risk-taking discussed by respondents is consistent with that found in previous literature.

The interview findings further indicate that mindset may relate to deep-seated philosophies such as lean. Lean initiatives aimed at continuous innovation strongly guided actions in one of the responding firms. Related to this, respondents also highlighted the importance of having a mindset where everyone is involved in innovation; in particular, to create a culture where innovation is an important philosophy in the whole organization, not just in R&D. It is therefore proposed in this report that organizational mindset should be included as a theme for innovation readiness.

Table 14 Differences between the literature study and the empirical study on innovation readiness.

Identified themes from analysis of empirical study	Related aspects from literature study	Main difference compared to literature study
Resources for innovation	Strategic intent Archetypes for innovation	Staff (competence) may also be a constrained resource
Intention for innovation	Strategic intent Organizational expectations for innovation	Metrics for innovation play important role for innovation culture
Infrastructure for innovation	The ambidextrous organization Archetypes for innovation Network structure for innovation	Few differences compared to literature
Organizational mindset	The ambidextrous organization (risk-taking) Organizational expectations for innovation	Mindset may also incorporate organizational philosophies, such as lean

6.1.2 Creativity and learning

In the literature framework (chapter 4), creativity and learning were identified as two separate dimensions. However, following the empirical findings, it is argued that they should be viewed as one dimension. The main reason for combining the two dimensions is that several responding firms arranged activities such as innovation jams, idea workshops or innovation days, which focused on both creativity and learning. For example, firms arranged innovation workshops which entailed both learning about the topic of the work-shop and generation of ideas on how the firm could become more innovative. One responding firm organized "innovation days" where employees were free to either learn about a new or interesting area or work on coming up with new ideas. The second reason for combining creativity and learning is that, based on previous literature, it may be argued that they are closely interrelated. For example, Amabile (1996) highlights expertise and creativity skills as factors of individual creativity, both of which require learning.

In the category of creativity and learning, three themes emerged from the data analysis: the individual level, the organizational level and the mindset for creativity and learning. The themes and their relation to previous literature are summarized in *Table 15*.

Individual creativity and learning

Individual learning consists of expertise, creativity skills and personal development. Amabile (1996) highlighted creativity skills, task motivation and expertise as factors for individual creativity. These factors also emerged as important in the empirical study, although motivation is not included under creativity and learning since it is included in a separate dimension. The need for expertise was emphasized in the interviews; in particular, technical expertise was highly sought after and considered important to enable creativity. However, having access to high level of expertise was not viewed as sufficient for creativity. One respondent exemplified the differences in creative output between engineers in his firm: "*In my department, almost everyone is an engineer or a PhD. In an average year, less than half of them come up with something they think would be worth patenting. […] But we have some who stand out, who come up with over 20 of those ideas every year. They are extremely innovative.*"

To promote individual creativity, respondent firms reported working with improving creativity skills. Creativity skills were promoted by engaging outside creativity experts in idea generation workshops to help employees think more creatively. Personal development or individual learning was also promoted. All responding firms stated that they offered opportunities for personal development in the form of courses and education. However, some respondents also expressed that it was the individual's responsibility to take initiative to further learning. To some extent, having the individual be responsible for learning is consistent with the argument by Andriopoulos (2001) that self-initiated activities are important for creativity.

Organizational creativity and learning

The concepts which were identified as part of the organizational level theme are work-group features, support, and knowledge sharing. Work-group features are explained by Amabile (1996) as complementary skills and knowledge in groups. This factor was particularly emphasized by respondents that managed software developers who worked extensively in teams, often in self-organizing teams. In addition to complementary skills and knowledge, the interviews indicate that gender equality and diversity are important work group features.

Organizational support for learning and creativity also emerged as a concept from the data analysis. The empirical findings showed that support existed in many forms, for example, responding firms discussed access to coaches for learning and creativity. Arguably the most interesting view was from respondents who used large-scale idea generation events, not just for generating ideas, but for signaling support for a culture of openness and ideas. As one of the respondents put it: "*[the idea generation event] is more about creating transparency and culture, than to make a list of the top innovations and implement those. We will probably do that as well. But it's more about supporting an open climate for ideas and creativity.*" As described by the respondent, the event was both about creating an open flow of communication as argued

for by Andriopoulos (2001), but also about signaling management encouragement for learning and creativity as stressed by Amabile (1998).

Finally, knowledge sharing was emphasized in both the literature study by Calantone et al. (2002) and in the interview study. Respondents discussed having databases to share knowledge, for example on lessons learned from previous projects. Notably though, the interviews indicate that informal networks were the most important factor for sharing knowledge. These informal networks inside the firm were enabled by individuals who had worked in the organization for a long time and therefore knew individuals in many other parts of the organization. While the existence of these networks may be no surprise, their importance should not be underestimated. Several of the respondents stressed that sharing knowledge in an informal manner was often far more effective than for example using databases to share lessons learned. In this study it is therefore concluded that informal networks should be added as an important factor for knowledge sharing.

Mindset for learning and creativity

The final theme for learning and creativity is mindset. Dweck (2006) argues that there are two basic mindsets; the fixed mindset and the growth mindset. The fixed mindset is characterized by the belief that one's qualities are fixed and cannot be improved, while the growth mindset is based on the belief that qualities can be cultivated through effort (Dweck, 2006, pp. 6-7). Extending this to an organizational level, the growth mindset would encourage testing and experimenting with unknown or uncertain areas, while a fixed mindset would lead to focusing on the traditional or known path. The interviews indicated that many organizations view failure as a necessary to the learning process, although some also view failure (e.g. when testing new technical solutions) as waste. The second view would arguably indicate a fixed mindset and could discourage experimentation and testing in the organization.

Open mindedness, which was identified by Calantone et al. (2002) is may also be considered as related to mindset. Open-mindedness may be viewed as the openness to new knowledge and ideas, for example in accessing external knowledge. Several respondents discussed the need for external knowledge and the importance of external knowledge as a source of creativity. However, some respondents also highlighted potential issues relating to intellectual property as preventing them from being more open.

Table 15 Differences between the literature study and the empirical study on creativity and learning.

Identified themes from analysis of empirical study	*Related aspects from literature study*	*Main difference compared to literature study*
Individual creativity & learning	Individual creativity Factors that promote creativity Learning and development	Few differences compared to the literature.
Organizational creativity & learning	Organizational creativity Factors that promote creativity Learning orientation Organizational learning	Significant focus in empirical findings on knowledge sharing and issues of doing that in large organizations
Mindset for creativity & learning	Learning orientation	Need to add literature on mindset for learning

6.1.3 Leadership and entrepreneurship

This dimension of the framework was renamed as a result the empirical findings. It was included since several respondents indicated that innovation culture is strongly affected by leaders and leadership. The focus on entrepreneurship was already identified in the literature review as a part of the dimension creativity and entrepreneurship. However, the interviews indicate that entrepreneurship is part of the wider dimension of leadership which also includes management support and participative decision-making.

The literature review found that intrapreneurs are crucial for successful innovation efforts (Börjesson et al., 2014), especially for disruptiveness (O'Connor & McDermott, 2004). Internal corporate venturing is highly cyclical and need careful management and focus (Burgelman & Välikangas, 2005). The empirical findings indicate that leadership and entrepreneurship also consists of being supportive, risk-taking and promoting trust and involvement of co-workers. *Table 16* summarizes the themes that relate to leadership and entrepreneurship and the main differences compared to the literature study.

Management support

The interview findings indicate that there is an essential need for management support in order for ideas to grow. The theme further comprises to communicate expectations, processes vs. flexibility, and long term vs. short term goals. Consequently, it is an important management task to set a vision and to emphasize it in words and action so that employees understand the set priorities. Indeed, this is similar to two important leadership capabilities described by Ancona,

Malone, Orlikowski, and Senge (2007): sense-making and creating a vision[2]. They state that it is difficult for any one leader to be complete. It is therefore important to build a culture in which leaders act together with each other and with employees.

The interview findings indicate that it is hard to drive innovative ideas forward without permission and support from managers. Respondents emphasize that managers need to listen to and consent to new initiatives to a certain degree. Furthermore some respondents argued that management needs to understand the effects of control in the sense of processes and standardization. In particular in the early phases of a new initiative, flexibility in the process was described as a critical element to innovative results: *"If you are striving to make a larger jump, a quantum leap, to move to a new S-curve. [If you have] the philosophy to do something different with a much higher customer value [...] the management approach cannot be process driven – there needs to be another principle!"* In similar ways, several respondents discussed the risk of focusing too narrowly on efficiency, instead of effectiveness. Management need to support not only cost improvement initiatives, but income increasing initiatives too. Due to the emphasis that respondents placed on management support, it is argued here that management support should be included as a theme in the dimension of leadership and entrepreneurship.

Entrepreneurship

The interview findings further showed that the organization's leaders need to create opportunities for entrepreneurship by promoting a mindset for innovation, tolerance for risk, intrapreneurship and allow for innovation championship. Since entrepreneurship is about successfully implementing ideas (Amabile, 1996), it is arguably a central part of an innovation culture. If ideas are routinely dismissed without leading to a concept, prototype, end-products or services, they are merely of philosophical use. Leaders therefore need to be willing to take risk, and encourage employees to try out ideas even if they may not be successful. In the interviews, respondents suggested that there should be a flexibility to try out ideas outside existing processes. Respondents also stated that people with passion for developing new ideas and concepts should be allowed to act as innovation champions and promote intrapreneurship.

Participative decision-making

The interview findings indicate that participative decision-making is an important factor which leaders may promote to develop an innovation culture. Leaders play an important role for participative decision-making since it is mainly their responsibility to allow employees to participate in decision-making and to give employees the opportunity not just to participate, but also to take responsibility for their own decisions. An example of participative decision-making that was emphasized by respondents was that leaders allow decisions to be made by the individuals who are most knowledgeable about the area instead of taking the decisions themselves. Another such example was to let the individuals who are most affected by the

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[2] They also suggest the capability to build relationships and the capability to cultivate inventiveness.

decision take responsibility. Respondents emphasized that to achieve this type of culture, there needs to be a high level of trust between leaders and co-workers.

The factor of participative decision-making adds to the findings from the literature study, which emphasized entrepreneurship and strong innovation champions as vital to an innovation culture. The findings in the literature review emphasized the importance of a strong individual who can make decisions and ensure that they are acted upon. However, this study finds that it is also important that leaders promote a culture where employees are involved in decision-making and where employees have the mandate to act on those decisions.

Table 16 Differences between the literature study and the empirical study on leadership and entrepreneurship.

Identified themes from analysis of empirical study	*Related aspects from literature study*	*Main difference compared to literature study*
Management support	Organizational expectations for innovation Factors that promote creativity	Confirmed in the empirical study
Entrepreneurship	Enablers and barriers for intrapreneurship Common reasons for failure of internal corporate venturing	Similar focus as the literature review, but less focus on monetary resources identified and more on risk-taking and flexibility
Participative decision-making	Innovation champions Intraprenurship	Participative decision-making may be an important aspect of intrapreneurship

6.1.4 Market orientation

Market orientation was described by Kohli and Jaworski (1990) as the field of generating, disseminating, and responding to customer needs. The dimension includes scanning the environment for information on customer needs, but also to scan for trends or technological advances which may be essential to fulfill those needs. Another part is to have an understanding of the value chain (Dobni, 2008) both upstream and downstream. The interviews support the results of the literature review and give a further understanding of what areas to focus on and how to gather, share and respond to customer input. The interview findings indicate that a firm's focus should lie on understanding their customers, in particular their needs, but also to understand what they value. In addition, respondents point out that it is important to scan for trends in the environment and for competing solutions. However, respondents also argue that firms need to push innovative products (or rather help customers understand their value) and

services to customers who do not necessarily ask for them. Interestingly, few additional stakeholders were emphasized by the respondents. The respondents thus view customers as the most important stakeholder and they argue that responding to customer needs is a key dimension of innovation culture. The five identified themes of market orientation are presented in *Table 17*.

Customer understanding

The interview findings show that customer understanding and customer focus is central to innovation culture. Respondents emphasize the need to try to maximize customer value as being crucial to successful innovation along with focusing on development to fulfill customer needs rather than technical specifications. Proper understanding of customer needs was identified as important. Some of the responding firms clearly separated customer needs from customer wants. Customer needs were viewed as not being connected to any specific technology and were therefore more difficult to measure. It was considered important to go beyond explicit wants and to understand the underlying needs of the customer. It was argued that needs were more stable over time and that properly understanding the needs would help firms to be more innovative and not focus too much on particular technologies.

Another aspect highlighted by respondents, is for each member of the firm to be close to the end-customers. This factor relates to having the customers in mind and to understand the problems and realities that customers face. The interviews indicate that this was done by meeting customers face to face and by performing the same tasks as customers to gain a deeper understanding for their realities.

Understanding the environment

The second group to consider according to the respondents is global or industry-specific trends, the action of competitors as well as the firm's own capabilities in relation to the environment. The latter is related to the fact that firms need to disseminate and respond to market intelligence and in order to do so effectively, need to know their own capabilities. Arguably, this factor is particularly relevant in large corporations that often have significant distances between different functions and departments.

Generation of market intelligence

The interview study indicates that the first step to generating market intelligence is to know what to look for and then there is a need to know how to find the relevant information. Respondents described different ways of working to understand their customers and the environment. The ways that were discussed were through collaboration with lead customers/users, through talking to customers, through studying customer behavior and through market and trend research with the help of external information agencies. Before the information is of any use it needs to be understood. The ability to filter information is therefore essential to the generation of market intelligence. One way that was discussed by respondents, to filter information, was to make sure

not to focus on any specific customer (if they are not making a unique product version for them) but to gather data from several customers and create a statistical information database. Another important factor when gathering information is to work interdepartmentally. Respondents expressed that collaborating across departments is highly important to gather different types of input from customers.

Dissemination of intelligence

The next essential step in a market orientation according to Kohli and Jaworski (1990) is to share market information. For example, if customer information is collected through collaboration between different departments or functions, the dissemination of the knowledge will also be facilitated. However, openness and communication between departments needs to take place continuously. Indeed, multiple respondents stated that a constant communication to share knowledge is important. An interesting finding from the interview study was that one firm ensured dissemination of market intelligence by having representatives from both sales and marketing and R&D interview with customers together in order to understand customer needs. In many firms, this task was only conducted by sales and marketing, which meant that the information had to be compiled by them and then relayed to R&D. By collaborating between departments in gathering market intelligence, dissemination was facilitated.

Responsiveness to intelligence

As the literature suggests, responsiveness is *"the action taken in response to intelligence that is generated and disseminated."* (Kohli & Jaworski, 1990, p. 6). This is a central step to having a market orientation and although it is connected to innovation readiness and leadership and entrepreneurship, this group differs in the sense that it more explicitly describes external collaboration and ways of responding specifically to market intelligence. The interview findings point to six factors to consider when responding to market intelligence: specification of demands; different planning horizons; resource dependence; customer collaboration; supplier collaboration; and education of customers. Kohli and Jaworski (1990) include selecting target markets, designing products, production, distribution and promotion as part of responsiveness. The factors proposed by Kohli and Jaworski (1990) differ from the empirical findings in the sense that they focus on *what* a firm does, in contrast to the empirical findings which focus on *how* firms do it and *why* those factors are important to consider.

An interesting finding from the interviews is that resource dependency may be an important consideration for responsiveness. According to resource dependency-theory, firms need to be careful when using market intelligence to guide decisions and need to be aware of the risk of focusing excessively on current customer needs instead of focusing on future trends or emerging needs (cf. Bower & Christensen, 1995). Although it is important to listen to customer needs, managers also need to consider technologies that do not currently meet customer needs or there is a risk of facing disruption (Bower & Christensen, 1995). At the same time, responding firms

highlight the risk of focusing too much on customer specifications instead of understanding the solution they need. When responding to market intelligence, collaboration across the value chain, both with customers and suppliers, is recommended by several respondents.

Table 17 Differences between the literature study and the empirical study on market orientation.

Identified themes from analysis of empirical study	*Related aspects from literature study*	*Main difference compared to literature study*
Customer understanding	Commercial focus for innovation Value orientation Market orientation	Customer focus focusing on customer needs
Understanding of the environment	Use of external sources Market orientation Scanning	Focus on trends and competitors
Generation of market intelligence	Generation of market intelligence	Focus on methods
Dissemination	Dissemination of intelligence	Constant communication needed
Responsiveness	Responsiveness to intelligence	Focus on how and why instead of what. Important to consider resource dependency as a risk for responsiveness.

6.1.5 Motivation and relations

This dimension describes how the way of working influences motivation (Deci & Ryan, 1985) and how relations impact productivity (Amabile & Kramer, 2011). The literature review found that participative decision-making and goal setting are important factors to motivation (Erez et al., 1990; Hurley & Hult, 1998). Furthermore, a job structure allowing autonomy in combination with a good inner work life was found to enhance determination to work (Amabile & Kramer, 2011; Gagné & Deci, 2005). Similar themes were identified in the empirical study. Three themes are suggested to be important to consider in relation to this dimension: self-determination; inner work life; and relationships, as shown below and in *Table 18*.

Self-determination

In line with the literature study, the empirical study confirms that freedom to control how you want to solve work tasks is an important factor in order to promote individual motivation. Another important factor that was not found in the literature study, but was emphasized by respondents is pride and passion in the firm. This means that employees who believe in their firm and are proud to be part of the organization are an important source of innovation. This is different from purpose – which is also identified by several of the responding firms to be important – in the sense that purpose is often considering the user of the product and how to help them, while passion is rather connected to the making itself. These findings can be understood by considering the fact that if you do not believe in what you are creating yourself – are you then able to truly engage in fulfilling the task to satisfy a potential customer? This study therefore finds that pride and passion are important factors relating to self-determination.

Inner work life

This theme largely supports the findings of Amabile and Kramer (2011) who state that manageable tasks, making progress and work in a climate where your thoughts are valued is conducive to creativity. Respondents state that time slack promotes innovativeness and that time slack is sometimes necessary to avoid exclusively focusing on solving day to day problems. Several responding firms work with agile methods, including having a pulse room where weekly discussions are used to communicate progress to team members. This gives fast feedback which is an essential ingredient to motivation (Ambrose & Kulik, 1999) at the same time as it visualizes progress. The empirical findings therefore largely confirm what has been claimed in previous literature.

Relationships

Good relations at work may seem a basic condition to being productive and innovative. The term relationship is used here to refer to working conditions in teams and collaboration and communication across different functions and departments. Both team work and cross functional collaboration were identified in the empirical study as facilitators to an innovation culture. Several firms highlight that they try to involve every member of the organization in the innovation agenda. Hurley and Hult (1998) found that participate decision-making led the way to being innovative. The interviews suggest that such an involvement should not only be made in teams, but across departments and functions to reach well-established decisions.

Table 18 Differences between the literature study and the empirical study on motivation and relations.

Identified themes from analysis of empirical study	Related aspects from literature study	Main difference compared to literature study
Self-determination	Self-determination Setting goals	Pride and passion are also important elements
Inner work life	Inner work life	Time slack can be an enabler
Relationships	Participative decision making	Includes work across departments and functions

The revised framework that has been presented in this section is used to categorize success factors and barriers to develop innovation culture in the next section. For each dimension, a number of success factors and barriers are identified.

6.2 Success factors and barriers for innovation culture

For each dimension of the framework, success factors and barriers to develop an innovation culture have been identified. These factors were brought forward by the respondents in the interviews. The success factors and barriers may act as support for managers in identifying courses of action to develop innovation culture.

6.2.1 Innovation readiness

This section will highlight the main success factors and barriers that were identified by respondents in relation to innovation readiness. For a more complete list, see *Appendix A – Overview of dimensions, themes and concepts*.

This study found two main success factors for creating innovation readiness. First, respondents mentioned flexibility in deviating from pre-defined processes as a key success factor. Respondents ensured flexibility by having simple and short process descriptions, thereby allowing individuals to navigate freely within pre-defined processes. Another respondent expressed a concern that his firm was formalizing processes to such an extent that there would eventually be few opportunities to be flexible and work outside the pre-defined processes. The respondent expressed concern for how that would impact the firm's capability to innovate, in particular to succeed with disruptive innovations.

Secondly, making innovation an organization-wide priority was highlighted as an important success factor in the interviews. One respondent described how the lean philosophy had become deeply imbued in the firm and manifestations of that philosophy could be seen in many of the firm's activities. The respondent hoped that innovation would become prioritized in a similar manner. A respondent firm that used large scale idea generation events viewed the events as means to make innovation an organization-wide priority: *"it's not mainly about the ideas; it's about creating a culture where everyone is aware of and feels responsible for our innovation efforts"*. To a large extent, this is consistent with the clearly communicated and shared firm objectives highlighted by Hamel and Prahalad (1990).

Three barriers to innovation readiness were also identified: over-use of indicators to control innovation, a lack of flexibility in resource allocation and a mindset focused on reducing risk rather than maximizing opportunity.

First, over-use of indicators to control innovation was emphasized by respondents as a barrier to innovation readiness. This was especially problematic in early stages of innovation and for short-term KPIs. Respondents considered KPIs to be beneficial for tracking overall progress, but stressed that the measures should be used only as indicators and not for control. One respondent described how he actively avoided using many of the KPIs which the organization required: *"At [company], people love KPIs. I don't. I think they are as far from innovation as you can come. If I demand that each task is useful and measurable, which is what these measures are for… I believe that kills the drive for innovation"*. It should be noted that the respondents did not take

issue with using KPIs in their traditional sense, but cautioned against using KPIs as means of control.

Second, one respondent viewed a lack of flexibility in resource allocation as a barrier that prevented the firm from having a readiness for radical innovation. Acquiring financial resources required budgeting for the resources and the respondent argued that radical innovation could not be pre-planned. As a result, the respondent argued that the firm risked being slow to respond to opportunities for radical innovation or to miss them completely. A potential solution would be to have a flexible budget for these opportunities which would be controlled by a CTO. This line of argumentation is consistent with the argument by Tushman and O Reilly (1996), that top management should be prepared to allocate resources to radical opportunities.

Third, respondents expressed a concern that their firms focused too much on reducing risk, rather than maximizing opportunity. When evaluating opportunities, firms often demand business cases with low levels of risk and a guarantee for payback and select low-risk projects rather than opportunities with more risk but potentially larger rewards. Tushman and O Reilly (1996) found that the mainstream and exploratory organization should have separate views of risk and risk taking should be encouraged in the exploratory business. However, the interviews indicate that risk was often viewed as something negative, causing the firm to focus on "safe bets". The success factors and barriers discussed above are presented in *Table 19*.

Table 19 Success factors and barriers for innovation readiness.

Innovation readiness	
Success factors	- Flexibility to deviate from pre-defined processes
	- Making innovation an organization-wide priority
Barriers	- Over-use of indicators to control innovation
	- Lack of flexibility in resource allocation
	- Mindset focused on reducing risk rather than maximizing opportunity

6.2.2 Creativity and learning

From the data analysis, several success factors and barriers for promoting creativity and learning were identified. The first success factor found in this study is to allow freedom and flexibility for both creativity and learning. Freedom should be given, not just in the form of free time, but also in freedom to test and experiment. In particular, respondents from the R&D department emphasized that early phases of product innovation required extensive testing and failing to yield results. Being given the freedom to test, but also freedom to choose what projects to work on was viewed as a success factor.

Second, informal networks were regarded as necessary for knowledge sharing. Maintaining and ensuring the existence of such networks should therefore be viewed as a success factor. For example, encouraging job rotation was expressed by respondents as beneficial for promoting such networks. A third success factor was to view failure as learning and not as waste. Arguably, this does not apply to all type of failure, but refers to smaller scale testing and early exploratory phases of innovation.

A fourth success factor, closely related to the view of failure, is to focus more on implementations than initial ideas. In particular, the responding firms that used large scale idea generation events expressed that a great challenge was to make sure that ideas from the events were realized and implemented; as one respondent put it: "*having a great idea is one thing, but realizing that idea is something completely different*". Another responding firm described that their success did not rest on high levels of creativity and great ideas, but instead on working iteratively to test and adapt ideas into something which the organization had the capabilities to implement.

A barrier to learning that was pointed out in the interviews is the inability to "unlearn". The term unlearn is used here to describe breaking old patterns and letting go of old behaviors to enable new learning. Respondents described the inability to unlearn as the ability to go against and challenge the dominant logic that existed in their organization. One of the respondents exemplified this by describing that while the firm's business model focused mainly on physical products; due to changes in the market, other aspects such as services became more important. The firm was trying to adapt to this change, but the respondent described that the adaption was slow and it was difficult for the firm to unlearn and change the product-dominant logic. *Table 20* presents the described success factors and barriers.

Table 20 Success factors and barriers for creativity and learning.

Creativity and learning		
Success factors	-	Allow freedom and flexibility for both creativity and learning
	-	Informal networks that enable knowledge sharing
	-	Viewing failure as learning and not as waste
	-	Focus more on implementations than initial ideas
Barriers	-	Inability to unlearn and challenge existing logic in the organization

6.2.3 Leadership and entrepreneurship

This section presents success factors and barriers regarding leadership that the responding firms highlighted as important to the leadership dimension. Some of the findings are presented in *Table 21*.

First, it was found that a strong success factor is that leaders clearly communicate a vision and a purpose to each employee. It may be argued that a clear vision and purpose is related to participative decision-making, which likely requires a shared purpose and vision between leaders and employees to work effectively. Another success factor that was found in the interview study is having leaders with a mindset to promote innovation. More specifically, respondents emphasized that the best leaders have mindsets that allow risk taking and experimenting by employees and where the leader allows slack time and resources to experiment. Some respondents argued that leadership required a certain sensibility and "feel" for what may succeed.

The first barrier related to leadership and entrepreneurship is to put excessive emphasis on control and try to make each activity measureable and value-adding. This may occur when leaders focus too much on reducing waste or try to create highly repeatable processes for innovation. According to respondents, leaders with a control-focus are likely to stifle individual creativity and to miss innovations that do not fit into pre-determined processes. Finally, a barrier may also be that there are too many changes occurring at the same time. Respondents described that when leaders run multiple change or improvement initiatives simultaneously that results in a lack of focus. Enacting too many changes at once also diverts attention and hinders the organization from making progress.

Table 21 Success factors and barriers for leadership and entrepreneurship.

Leadership and entrepreneurship	
Success factors	- Leaders clearly communicate a vision and purpose - Leaders with a mindset to promote innovation
Barriers	- Excessive emphasis on control and measuring - Attempting to run too many initiatives at once diverts employees attention

6.2.4 Market orientation

In market orientation, three main success factors were identified. First, a deep understanding for customer needs was emphasized by respondents as crucial to market orientation. While it is easy to examine customer wants in terms of technology, respondents stressed that there is a need to understand customers on a deeper level. Some saw this as understanding the underlying values that customers prioritized, while others viewed it as having a good understanding of the

problems that the customer faces and wants to solve. Second, respondents expressed that it is vital to have the goal to maximize end-customer value when innovating. This means that innovation should not be driven by technology push, but rather by a pull from areas where value for end-customers can be identified. Finally, it was emphasized that there is a need to have a wider stakeholder perspective, not just on customers. While customers are often the most important stakeholders, there are often other key stakeholders that need to be understood as well.

Some barriers to market orientation were identified. First, respondents discussed the risk of focusing too much on current customers and their needs, instead of future customers. Focusing excessively on current customers could lead to missing important trends and the firm could risk missing opportunities for radical innovation. A second barrier was a significant distance to end-customers, both physically and in the organizational structure. Several respondents described that customers were often spread geographically and that there were multiple intermediaries between the firm and its customers. This makes it difficult to gain a deep understanding of the problems and realities of the customers. The success factors and barriers discussed here are presented in *Table 22*.

Table 22 Success factors and barriers for market orientation.

Market orientation	
Success factors	- Understand customer needs, not just in terms of technology but in terms of values - Start development with end-customer value top of mind - Focus on full stakeholder view, not just the direct customer
Barriers	- Focusing too much on current needs, not future needs - Significant distance to end customers

6.2.5 Motivation and relations

The main success factors for developing motivation and relations are presented in *Table 23*. The first success factor is to minimize control and allow significant freedom and autonomy for employees. Respondents discussed multiple nuances of this factor, but the essential aspect is to make sure that there is sufficient freedom for employees to direct their own work. In cases where work is excessively controlled, respondents described that the willingness to innovate and find new solutions suffers. Second, an open culture where ideas and problems can be discussed, even though they may be controversial was also seen as a success factor. Respondents described that being able to discuss problems openly ensures that the problems are solved quickly and effectively.

Third, respondents expressed that innovation related activities, such as idea generation workshop benefit from being voluntary. Having voluntary activities ensures that participants find them fun and engaging and leads to better results. Finally, respondents also emphasized that motivation needs to be adapted to the needs of the individual. It was argued that for many, public recognition is highly important, while for others it may be counter-productive. Therefore, there is a need to base motivators on the needs of the individual.

Three barriers are also shown in *Table 23*. First, respondents stated that inability to demonstrate progress results in employees being less enthusiastic about innovation. If no clear progress is communicated, there is a risk that employees become unmotivated. Another barrier is to create incentive structures that lead to internal competition rather than collaboration. This barrier was described as particularly relevant for firms that use some type of competition to stimulate idea generation. Finally, having too homogenous teams was seen as a barrier. It was described that ability to challenge one another is important in an innovation culture.

Table 23 Success factors and barriers for motivation and relations.

Motivation and relations	
Success factors	- Minimize control and allow significant freedom for employees - Ensure that ideas, problems etc. can be discussed openly - Make innovation related activities voluntary - Base motivators on individual preferences
Barriers	- Inability to show progress or follow through may inhibit future initiatives - Too many pre-defined tasks and time pressure reduce motivation to innovate - Creating incentive structures which lead to internal competition rather than collaboration

7 Results

This chapter briefly presents the main findings from the study, including a complete innovation culture framework and some comments on how the framework may guide managers. An overall view of the main success factors and barriers to develop innovation culture is also presented.

7.1 The framework

Based on the analysis presented above, a final innovation culture framework has been constructed and is shown in *Figure 11*. The framework highlights the five dimensions of innovation culture along with the themes of each dimension. Each theme also consists of first order factors that can be found in the appendices for each dimension.

In addition to the descriptions of each dimension in previous chapters (see chapter 4 and chapter 6), this thesis provides more comprehensive lists of success factors and barriers that are useful to consider when developing innovation culture. These lists can be found in the appendices starting on page 88. As a starting point for developing the culture an overview of the dimensions, identified themes and concepts are presented in *Appendix A – Overview of dimensions, themes and concepts*. It is worth noting that the framework is not to be seen as best practice nor should it be regarded as "how things should be done" in an organization. Indeed, as shown in the cases in chapter 5, innovation culture may vary between organizations and there is arguably no "one right way", as firms may be set up in several different ways and still be successful. Rather the framework is intended to be used as guidance for managers while also considering local contexts and experiences. For example, managers who aim to develop innovation culture may use the framework as a basis for discussing their current culture and for identifying areas in which the culture may be developed further.
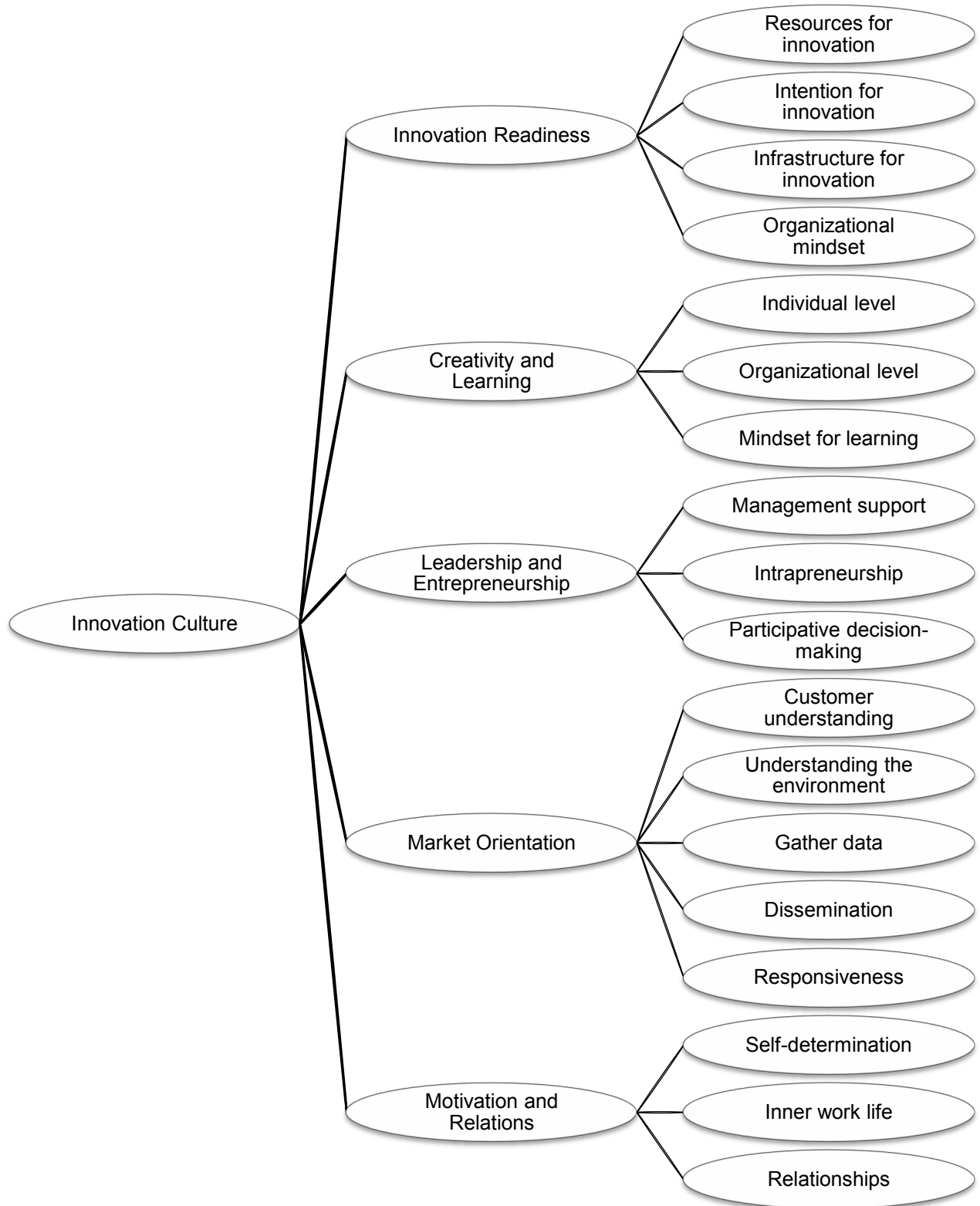
Figure 11 Proposed framework of innovation culture in five dimensions and 18 themes. Source: Authors.
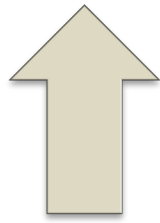
7.2 Success factors and barriers

In chapter 6.2, the success factors and barriers were presented in relation to each dimension of the framework. Some the identified factors are not exclusive to one dimension, but influence multiple dimensions of the framework. When developing an innovation culture a change in one dimension will impact other dimensions as well. Indeed, working to overcome the previously identified barriers or attempting to replicate success factors is likely to influence the whole culture at the firm.

To summarize the results and visualize a few of the factors which have a wide influence on innovation culture the main success factors and barriers are presented in *Figure 12*. Similar to the framework, the success factors and barriers may act as guidance for managers who aim to develop the innovation culture in their organizations. While there is no exact "how-to" for replicating success factors or overcoming barriers, the factors presented here may be grounds for discussions on how a firm's innovation culture can be developed.

The success factors presented in *Figure 12* are: shared purpose, supportive leadership, sufficient resources and a profound customer and market understanding. A shared purpose was found to be important both for innovation readiness and motivation and relations. A shared purpose consists of making innovation into an organization-wide priority and a clear purpose was also found to be a factor for motivation in the literature study. In an innovation culture, a supportive leadership is important since leaders play a critical role in supporting and developing new ideas as well as deciding what employees should focus their efforts on. Resources, in particular time, are critical to an innovation culture and a success factor is to make sure that there is a willingness to dedicate resources which enable individuals to experiment with new ideas and to be persistent in working with innovation. Finally, an organization-wide customer focus may help the firm to succeed in innovating by better meeting the needs of current customers, but also to meet the needs of new customers. An organization-wide customer focus entails looking beyond explicit wants to understand customer needs and problems.

The main barriers that were found are risk aversion, excessive control and insufficient cross-functional collaboration. First, a risk-averse organization is not willing to accept the risk that often comes with trying to innovate. Instead, the risk-averse organization focuses on safe bets, and tries to minimize risk, rather than maximize opportunity. Risk aversion was seen as a barrier both for creativity and learning and in the leadership dimension. Second, firms with excessive control implement performance metrics and attempt to reduce waste to such an extent that it stifles the organization's ability to innovate. Excessive control was described as having a negative impact on motivation and relations. Finally, insufficient cross-functional collaboration was identified as a barrier to innovation culture. In large firms in particular, knowledge may be highly dispersed, and a lack of cross-functional collaboration could lead the firm to miss significant opportunities to innovate since knowledge is not shared with other departments.

Shared purpose
Supportive leadership
Willingness to dedicate resources
Organization-wide customer focus
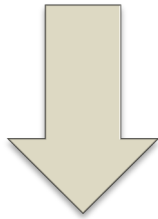
Risk aversion
Excessive control
Insufficient cross-functional collaboration

Figure 12 Overall success factors and barriers to develop innovation culture. Source: Authors.

8 Discussion and future research

In the following section, it is discussed how well the purpose of this thesis is fulfilled. Some interesting findings are discussed and areas for further research are identified.

This paper set out with the purpose to contribute to the understanding of innovation culture by proposing a framework that explains the concept and by identifying factors that influence its development. Based on that purpose, two research questions were formed that guided the research. First, it was asked: what constitutes innovation culture? Second, what factors do Swedish firms identify as success factors and barriers to develop innovation culture? The aim of the study was to provide a framework to understand innovation culture and to identify success factors and barriers which could act as managerial guidance to develop innovation culture.

This thesis has contributed to the understanding of innovation culture by proposing that the concept can be described in five dimensions: innovation readiness: creativity and learning, leadership and entrepreneurship, market orientation, and motivation and relations. This contrasts Dobni (2008) who proposed innovation culture as consisting of four dimensions and seven factors. Most notably, the innovation culture concept proposed here differs from Dobni's by incorporating motivation and leadership as separate dimensions. The main reason for including motivation and relations in the framework is to incorporate literature (see section 4.6) that emphasized the importance of motivation for promoting innovation. The leadership and entrepreneurship dimension was identified during the empirical study, in which multiple respondents emphasized the importance of a leadership that supports and facilitates innovation.

The second contribution of this thesis was the identification of key success factors and barriers to develop an innovation culture. Multiple success factors and barriers were identified for each dimension in the framework. However, no ranking of the most important factors was made. Arguably, the empirical and literature findings indicate that having right set goals (Erez et al., 1990; Ryan & Deci, 2000) in combination with an organization that clearly values innovation is strongly conducive to an innovation culture. Gagné and Deci (2005) argued that intrinsic goals are important to motivation and to help individuals perform and innovate. However, this thesis has also indicated that a shared purpose helps in developing innovation culture. The importance of a shared purpose in which employees feel involved is also shown by Denison et al. (2004) who state that the level of involvement and adaptability in an organization are the best predictors of innovation. The empirical findings showed that the studied firms have managed to create a shared purpose among organizational members, often in the form of a simple statement, such as being world-leader in a certain area. This purpose acts as a rule of thumb that guides the behavior of the organization's members and strongly influences the firm's innovation culture.

The ability to generalize the findings in this thesis is also an important point of discussion. As highlighted in section 2.5, the sample of responding firms in this study is somewhat skewed. The studied firms include large, publicly listed firms, predominantly in the industrial sector and with a strong focus on patenting. The respondents came from only two departments: R&D, and sales

& marketing. In addition to the skewed sample, culture differs between geographical regions (cf. Hofstede, 1990). Both these factors therefore limit the ability to generalize the findings. However, it is argued in this thesis that the findings may be generalized to a limited population. Viewing culture as a limiting factor, the findings may be generalized to Nordic firms, since it may be argued that Nordic countries have similar cultures. Based on the sample, the findings should transfer well to large industrial firms in this region.

In conclusion, this research has produced a framework for understanding innovation culture and added to the understanding of how such a culture may be developed through a detailed literature review; an extensive empirical section based on interviews with innovative firms; and analysis of the empirical findings. While the framework focuses on the concept of innovation culture it is also proposed that the framework may be of practical use to firms that wish to become more innovative. This thesis provides managerial guidance by providing the overall framework as a basis for understanding innovation culture and through the list of success factors and barriers which can be used to develop innovation culture. It should also be noted that innovation culture and innovativeness are not the same concept; however, it may be argued that they bear a close relationship. The innovation culture framework may therefore provide guidance for firms by highlighting success factors that can be replicated, or barriers that can be overcome and which are likely to impact the firm's innovativeness.

Future research

The innovation culture framework opens three particularly interesting areas for further research. First, the dimensions of innovation culture identified here may be validated by further studies. The proposed framework incorporates a wide array of factors that constitute the dimensions of innovation culture and it would be interesting to further explore each dimension. Second, innovation culture should be studied in other cultural contexts, such as in other countries. Third, the correlation between innovation culture and performance should be explored. An interesting hypothesis to test is if a highly developed innovation culture also correlates with high innovation output. Such a study entails multiple challenges, such as developing scales for measuring innovation culture as well as using appropriate measures or indicators for innovation output.

The success factors and barriers that were identified in this thesis were done so from the empirical findings. Multiple factors were suggested by the respondents and these are presented in the thesis. Despite the previous discussion on the importance of a shared purpose, it is unclear how influential each success factor and barrier is to develop innovation culture. An interesting area of future research is therefore to further explore these factors and to better define them as well as to discuss potential solutions to key barriers.

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Appendix A – Overview of dimensions, themes and concepts

This appendix presents an overview of the dimensions, themes and concepts that make up innovation culture.

Dimensions	Themes	Concepts
Innovation readiness	Resources for innovation	Money
		Dedicated time
		Staff
	Intention for innovation	Metrics
		Innovation strategy (patenting)
		Intention for innovation
		Type of innovation (product, business model, process, other)
	Infrastructure for innovation	Bureaucracy
		Formalization
		Decentralized
		Separate structure for innovation
		Stage gates
	Organizational mindset	Tradition vs. Change
		Lean
		Organization wide activities
		Management of risk
Learning and creativity	Individual level	Expertise
		Creativity skills
		Apply learning
		Freedom and flexibility
	Organizational level	Work group features
		Support for learning & creativity
		Lessons
		Unlearn
		Knowledge transfer
		Informal networks
		External knowledge
		Open innovation
		External ideas
		Idea-generation
		Idea screening
	Mindset for learning	Testing and experimenting
		Value of failure
		Ideas vs. Implementation
Leadership and Entrepreneurship	Management support	Management support
		Communicate expectations
		Short-sightedness
		Control
	Intrapreneurship	Mindset for innovation
		Tolerance for risk
		Innovation championship
		Intrapreneurship
	Participative decision-making	Decision-making
		Responsibility
		Create possibility for innovation
		Trust
		Lack of focus

Market orientation	Customer understanding	Distance to customers
		Customer needs
		Customer value
	Understanding of the environment	Understanding trends
		Understanding the competition
		Exploit internal knowledge
	Gather data	Lead customers
		Talk to customer
		Study customer behavior
		Statistics/Filter information
		Work interdepartmentally
	Dissemination	Share knowledge
		Understand the full range
	Responsiveness	Specification of demands
		Different planning horizons
		Resource dependence
		Customer collaboration
		Supplier collaboration
		Educate customers
Motivation and relations	Self-determination	Freedom
		Autonomy
		Pride
		Equality
		Interest/initiative
		Passion
		Drive
		Purpose
	Inner work life	Fun
		Progress
		Manageable tasks
		Openness
		Time pressure of regular work
		Stress
	Relationships	Involvement
		Team work
		Workshops
		Cross functional
		Communication
		Recognition
		Rewards

Appendix B – Innovation readiness

This Appendix presents barriers and success factors for readiness.

Themes	Concepts	Success factors	Barriers
Resources for innovation	Money	Sufficient monetary resources; Flexible budget control	Full R&D budget (to radical innovation); Lack of flexible budget, difficult to get money for innovation
	Dedicated time	Dedicated time, individuals finding/taking time, no managerial control of time spent, flexible time schedules (slack) in R&D	Fully schedule of every day work, lack of control over own time
	Staff	Access to external competence	Little internal staff dedicated to innovation, key staff worn
Intention for innovation	Metrics	Slow measure of progress (overall direction instead of individual initiatives), experience-based metrics (on gut feeling), measure – do not control based on metrics, only use key metrics for control (e.g. New product sales)	Organizational requirements of rigorous measurements, quarterly-based measurements, measuring "everything", converting KPI's to targets
	Innovation strategy (patenting)	Innovation as an implicit mean to have the best products, innovative products as explicit strategy, Strategy to only release products that are protected by patents	
	Intention for innovation	Articulated managerial expectations for innovation; Means to other end (e.g. Innovation as a mean to be leading in other areas), part of core values	
	Type of innovation (product, business model, process, other)	Separate department for business model innovation	Legal obstacles to interesting business model innovations, Conservativeness to innovate business model,
Infrastructure for innovation	Bureaucracy		Large organization -> high degree of bureaucracy (low % of value added time), processes for their own sake
	Formalization	Retaining startup atmosphere, flexible and uncomplicated processes	Distance between related departments due to organizational structure, processes for

			everything, replicable processes are unsuitable for innovation
	Decentralized	Cooperation between decentralized units, close to market	Central initiatives are slow to implement/diffuse
	Separate structure for innovation	Distinction between early and late development; Separation of new product development and existing product improvement, Separate goals for each stage in the innovation process - e.g. High goal fulfillment late	Running all innovation initiatives as projects, making promises to customers too early in innovation projects, managing radical and incremental innovations in the same processes
	Stage gates	Gated innovation processes, Adapt gates for early research/development	Focusing gates too much on time - not customer value
Organizational mindset	Tradition vs. Change	High responsiveness to smaller changes, innovation as a tradition	Difficult to enact changes
	Lean	Lean and continuous improvement in the entire organization	Focus on reducing waste instead of maximizing customer value
	Organization wide activities	Innovation seen as an organization-wide activity	
	Management of risk	Allowing high levels of risk in early development	Focus on reducing risk -> lack of courage - e.g. Demanding a business case for every decision

Appendix C – Learning and creativity

This Appendix presents barriers and success factors for learning and creativity.

Themes	Concepts	Success factors	Barriers
Individual level	Expertise	A small number of creative people come up with a large number of innovations; Having an entrepreneurial environment to retain and motivate creative people, Hiring doctors, engineers, experts	
	Creativity skills	Train work groups in creativity	Engineering culture to say no to ideas - "yes, but..." Instead of "yes and..."
	Apply learning	Get the opportunity to apply learning	
	Freedom and flexibility	Dedicated free time to creativity/innovation; freedom to chose your own projects	Planning up creative people's time (engineers); meeting culture
Organizational level	Work group features	Self-organizing teams; Diverse teams/new perspectives; Temporary work groups	Too homogenous groups, Tying up creative people in long projects
	Support for learning & creativity	Experts/coaches for creativity & learning; Available courses; Learning - up to the individual	
	Lessons	General courses & competence development; courses targeted specifically at innovation/creativity	
	Unlearn		Inability to drop competences which have become obsolete
	Knowledge transfer	Constantly working in teams - programmers; Workshops to convey lessons learned from projects; Databases for knowledge sharing	Too little internal knowledge sharing, Databases for sharing knowledge are available but not used, Lack of rotation
	Informal networks	Informal networks of experienced staff enable knowledge sharing	
	External knowledge	Identify specific knowledge that you lack, use of consultants to gain external knowledge	Not enough resources to work with externals, high transaction costs and risks, not enough work with external actors
	Open innovation	Finding long-term partners; Mitigating risks in	Potential issues regarding IP-ownership,

		relationships with asymmetrical power distributions, Industry-networks to share best practice on innovation management, Innovation brokers	Very difficult to find owners for external ideas
	External ideas	Easier to get traction for ideas that originate from the market	Very few people knowledgeable about the product prevents open innovation; Belief that better knowledge exists inside the organization, belief that customers only contribute with incremental improvements
	Idea-generation	Dedicated events to idea generation; Main idea generation in line-organization; Create buzz around new ideas	Risk for competition between departments; Difficult to find owners for ideas from events
	Idea screening	Test ideas that at least 2 persons like; Screening by experienced group/council	Evaluating ideas too much based on business case and strategy
Mindset for learning & creativity	Testing and experimenting	Give ability to test/experiment on a small scale, Dare to test with actual customers	Demand for efficiency in early/creative phases, Difficult to build in-house competence for fear that it may become obsolete
	Value of failure	View failure as learning	View of bad ideas as waste
	Ideas vs. Implementation (idea management system)	Having the "right" people work with creativity or implementation, making ideas visible in idea management system	Not properly caring for new ideas, prioritizing ideas over implementation, lack of forum to spread ideas

Appendix D – Leadership and entrepreneurship

This Appendix presents barriers and success factors for leadership and entrepreneurship.

Themes	Concepts	Success factors	Barriers
Management support	Management support	With management support ideas grow. Leaders who act as they teach.	Without management support employees are only able work "under the radar". It is not possible to drive radical innovation without management support.
	Communicate expectations	Communicate the vision and the purpose so that everyone is aware of and takes the time to be innovative.	
	Short-sightedness		Not having the long-term sustainability in mind.
	Control		Trying to put too much work into processes in the search for predictability.
Intrapreneurship	Mindset for innovation	Set the mindset for innovation. The mindset includes the will to develop better products and to have a customer (service) focus. Humble, professional and not staying satisfied.	
	Tolerance for risk	Flexibility and allowance to try out new ideas outside the process. A lot of risk should be taken in the early concept development to dare to try the unknown.	Mitigating risk can be dangerous if people do not dare to try out new ideas feeling they may not be successful. Demanding that everything should create direct value at all times.
	Innovation championship	People who have a passion for their ideas work to develop them.	The risk that strong individuals have a difficulty to kill their own projects even if they face failure.
	Intrapreneurship	Allowance of not only innovators but intrapreneurs.	
Participative decision-making	Decision-making	The one with the best knowledge should take the decision. Decisions are taken in councils including different departments.	Decisions that are taken based on guesses.

Responsibility	It is important with supportive leaders that take responsibility to make ideas happen. Communicate to the organization that everyone is responsible for innovation. Open to help your co-workers at any time.	
Create possibility for innovation	Give the opportunity to be innovative. Supply employees with methods, processes, and tools around innovation. Give people the freedom to start new initiatives.	Not allowing employees to try out new ideas and projects.
Trust	Trust in that the employees possess the required knowledge. Believe in the individual's ability to be effective and efficient.	
Lack of focus		Driving too many changes at the same time.

Appendix E – Market orientation

This Appendix presents barriers and success factors for a market orientation.

Themes	Concepts	Success factors	Barriers
Customer understanding	Distance to customers	Allow and make sure each co-worker visit and face the customers.	Long distance and lack of understanding of end customers creates development led by guesses.
	Customer needs	Important to separate needs from technical solutions to fully grasp what product to deliver.	Focusing on technical development instead of satisfying a need.
	Customer value	Always develop with highest possible customer value in mind and avoid development for the sake of technology.	Missing the role of each moment the product is used and handled - from deliver to scrap.
Understanding of the environment	Understanding trends	Study other people and organizations to understand trends. You need continuous market input.	Too much inward focus with loss of understanding of changes in the environment.
	Understanding the competition	Understand when a competitor solution is a threat and when it is not.	Not knowing when the cost of further development exceeds the customer benefit.
	Exploit internal knowledge	Scan for new market segments with existing knowledge. Breakthroughs often come from within the firm - not from customer requirements.	
Gather data	Lead customers	Constant discussions with the most important segments.	
	Talk to customer	Voice of the customer is a powerful tool to understand customer needs. The developer speaks to the one with the need. Feedback.	
	Study customer behavior	Study customer behavior. Act as we were the customers ourselves.	
	Statistics/Filter information	Sort needs from each other by using the needs of many.	Deciding an improvement upon the latest customer visit instead of looking at the portfolio of customer needs.
	Work interdepartmentally	Sales men, marketing, and developers collaboration. Collaborate across departments to find the needs.	

Dissemination	Share knowledge	Have a constant communication within the organization to share external knowledge.	
	Understand the full range	See the complete product as a system including services, financing and product.	Narrow focus without seeing the whole system.
Responsiveness	Specification of demands	Allow the developer to take part of their development decisions.	There is a risk of acting on to specific needs that are not generally needed. That developers act on pre-defined specifications without understanding the original need.
	Different planning horizons	You need to foresee customer needs because they have a shorter time focus than time to develop requires.	The balance between radical innovation and time to market need to be balanced.
	Resource dependence	Understand that needs differ in the market and that you may be blinded by your customer.	Developing for the few with the intention to develop for the mass market. Listening too narrowly on your customers, and letting yourself be controlled by their demands. The trap of believing that tomorrow's success will be the same as today's.
	Customer collaboration	Working as consultants at the customer sites gives possibilities to drive innovation and development from customer needs. Aftermarket provision of customer feedback. Talk to the developers and users. (Not the purchasing department).	Trying to meet to customer wants instead of needs may create complexity which diminishes the return.
	Supplier collaboration	Collaborate both with customers and suppliers in the development of new products and services.	
	Educate customers	By teaching customers how to use the product experienced customers suggest changes.	Not realizing that education may be a service that is expected to be part of the product or a chance to exceed expectations.

Appendix F – Motivation and relations

This Appendix presents barriers and success factors for motivation and relations.

Groups	Concepts	Success factors	Barriers
Self-determination	Freedom	Broad job descriptions. If you give people the freedom to create they will. Allow freedom to be innovative. Freedom with responsibility.	
	Autonomy	It is important that each department and or individual themselves have the control of how to solve the task.	
	Pride	There is a pride to work here.	
	Equality	Right person at the right place, equality and inclusion.	
	Interest/initiative	Innovation depends on the individual interest. You cannot force an area to be innovative around.	The greatest challenge is to keep the spirit and inspiration.
	Passion	People with a passion for the product create ideas.	
	Drive	Innovation builds upon the individual drive.	
	Purpose	There is a common purpose to be in the lead and deliver high quality.	
Inner work life	Fun	Exciting and fun projects.	
	Progress	Visual feedback or other response on the progress.	If you do not see progress the initiative quickly dies.
	Manageable tasks	Tasks need to be not more challenging than that you are able to handle them and related to your skills.	
	Openness	You can always discuss an idea with anyone.	Departments are separated without continuous collaboration.
	Time pressure of regular work	There is enough time to being innovative.	Too many set tasks give no time to being innovative.
	Stress		You cannot be innovative if you are too stressed.
Relationships	Involvement	Involve everyone to some degree (in decision making and control).	
	Team work	Innovation is a team sport. Teams are common. Teams are self organized the members challenge each other.	
	Workshops	To find the right people. To get ideas to problems and	

	challenges.	
Cross functional	Cross-functional teams especially early in the projects. Work across departments and functions.	
Communication	Collaboration between different functions. Informal relations. Find opportunities for development and job rotation.	Lack of communication between departments.
Recognition	Give a reward through recognition.	
Rewards	It is very individual whether you like rewards.	Rewards which create internal competition. A floating part of the salary did not have the desired effect.

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Appendix G – Interview template

This Appendix presents the interview template used. Note that the template was used as a guide to the themes used in a semi-structured manner. Deviations were thus made from the template.

General questions

1. How would you describe the culture in this firm? Example?
    o   What factors do you consider most important/unique for your culture?
2. Are you innovative? In what ways?
    o   What do you see as success factors to be innovative?
3. How are decisions made in innovation projects?
    o   How do you decide what to go for or not?
    o   How do you evaluate projects?
4. Which type of people are important for your innovation? Who are the key people and in what ways are they key people?

Innovations readiness

1. How is innovation reflected in your targets, vision and mission?
    o   Do you have an outspoken innovation strategy?
2. Do you differ on certain types of innovation?
    o   E.g. large vs. small?
    o   Products vs. process?
    o   Radical vs. incremental?
    o   Are there different structures to take care of different types of innovation?
3. How do you make sure that there is enough money/time (resources) for innovation projects? Example?

Creativity and entrepreneurship

1. Is creativity important in your organization?
    o   Do you have an example of a project in which it was important to be/you were creative?
    o   How do you support creativity?
2. How do you support entrepreneurship and commitment in new projects in the organization?
3. What are the challenges with getting people to be creative and using that creativity?

Organizational learning

1. How do you support learning within the firm? Examples?
    o   What are your possibilities to learn more? Internal knowledge development?
2. How do you work with sharing knowledge within the firm? Across divisions?

3. What is the greatest challenge to achieve a constantly developing/learning organization?
    o How do you work to maintain the position that you have today?
4. How is learning and development connected to your overall (innovation) strategy?
5. In what ways is learning and development rewarded?

Market orientation

1. How do you collect ideas from customers or external stakeholders?
    o Do you work with different types of customers, e.g. lead customers to bring forth innovations?
    o Do you have a structured way to do so?
2. How do you work with understanding changes in the market and stay ahead of competitors?
3. What is the greatest challenge when working with a market-/customer orientation?

Motivation and collaboration

1. What are the prerequisites to have motivated employees and commitment, and a constant flow of contributions of new ideas in the work place? Example?
    o Certain careers paths?
    o Rewards?
    o Feedback, autonomy, purpose?
2. How is the communication and collaboration between different departments?
3. How are decisions made in teams (in innovation projects)?