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Assessing Innovation Capability:

Identifying Elements and Proposing Actions to Monitor a Firm's Ability to Innovate

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Supply Chain Management

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Abstract

Innovation has caught the interest of both researchers and practitioners for understanding how firms achieve and sustain competitiveness. According to management scholars, firms must build their innovation capability in order to survive and thrive in today's dynamic and complex markets. Innovation capability is a complex concept that can be described as a characteristic of a firm's preparedness for innovation, and its development of 'innovation muscles'. Although attempts have been made to understand the concept of innovation capability, and its connection to innovation outcomes and ultimately firm performance, there is still no comprehensive framework for assessing innovation capability.

This single-case study, made in collaboration with a firm referred to as SupplyIT, has been conducted through the use of semi-structured interviews and observations at the company during the Spring of 2019. The aim of this study is to assess SupplyIT's innovation capability by first identifying the elements making up the capability for innovation, and second, exploring how these can be assessed to enable the development of said capability. The study contributes to both practitioners aiming at building their firm's innovation capability, and academia by providing insights into the elements of a firm's innovation capability and how these elements can be assessed. Eight elements of innovation capability have been identified as a result of the study and presented as a framework consisting of *1) organisational structure, 2) vision and strategy, 3) individuals and teams, 4) company culture, 5) top management support, 6) innovation network, 7) innovation process and 8) innovation support function.* These elements are found to be highly interrelated, and as such, they must be considered from a systems perspective. Qualitative means of assessment are argued to be the most suitable to monitor the development of these elements, and therefore the firm's innovation capability.

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1 Introduction

In today's dynamic and complex markets, innovation development is seen as the holy grail for firms to achieve sustainable competitive advantage (Assink, 2006; Lawson and Samson, 2001; Mascitelli, 2000; McDermott and O'Connor, 2002; O'Connor, 2008; Tushman and O'Reilly, 1996). Key activities for innovation development include generating new ideas as well as commercialising them (Schwab, 2018). However, this is a complex process and organisations have to be willing, and have the ability, to change and embrace opportunities in order to succeed (Schwab, 2018). Having an 'innovation capability' has been argued to be a crucial factor when examining a firm's potential for developing innovations and sustain its competitiveness (Björkdahl and Börjesson, 2012). The innovation capability concept refers to a firm's ability to renew itself for a changing environment by being innovative (Björkdahl and Börjesson, 2012). However, the ability to renew itself is challenged by the inherent uncertainty of innovation work, where people have to take risks and trust their intuition in the hopes of succeeding (Schumpeter, 1934). Therefore, firms must handle the trade-off between exploiting: working with existing businesses generating revenue streams and exploring: working with potential new business opportunities (Moss-Kanter, 2006). Schumpeter (1934) states that innovation work requires different goals and performance measures than the commonly used financial ones. For example, a different performance measure could be the knowledge created by new insights that lead to a change in the old patterns of action, since not all initial ideas will be viable for commercialisation. By exploring new ideas, and successfully implementing and integrating them into the organisation, a firm is said to possess an innovation capability (Börjesson and Elmquist, 2011).

Several studies have been conducted on the topic of innovation capability, but due to the current complexity and fragmentation of the research field (Crossan and Apaydin, 2010), more research is needed to understand the elements that constitute innovation capability and how to assess this over time. Moreover, the concept of innovation capability is currently perceived to be too abstract, making it difficult to apply it in practice, which is another reason why more research on the topic is needed (Björkdahl and Börjesson, 2012).

1.1 Aim and Research Questions

In response to the growing interest in innovation capability among both practitioners and researchers, this thesis aims to assess a firm's innovation capability by identifying elements and proposing actions on how these can be monitored, with the objective of enabling the development of the firm's innovation capability. In order to achieve the aim of the study, the following research questions have been formulated.

RQ1: What elements create a firm's innovation capability?

RQ2: How can these elements be assessed to enable the development of a firm's innovation capability?

1.2 The Context of SupplyIT

A firm that aims to increase its innovativeness is SupplyIT. The firm is a provider of cloud-based software solutions for transportation and delivery management with the head office located in one of the larger municipalities in Sweden. SupplyIT serves as this study's object of investigation and was chosen due to the firm's desire to assess its innovation capability. The mission of the firm is to 'lead the market' and 'create the future', where the latter aims to increase the firm's innovation efforts. SupplyIT was founded in 1998 and has during the past few years grown exponentially, both in terms of annual revenue and number of employees. By the end of 2018, the total number of employees was estimated to around 270, with the vast majority, around 200 people, working at the head office in Sweden.

The CEO of the firm strives to make SupplyIT the best workplace in the world. This has resulted in a flat organisational structure and a company culture that focuses on individuals and their commitment. So called 'customer teams' are responsible for delivering to customers and these teams are organised into sectors, based on similarities between customers. Further, the sectors are organised into clusters in an attempt to bring decisions down from the firm level. Each cluster contains a dedicated R&D team dealing with general solutions to the customers. See figure 1 for a visual representation of the firm's organisational structure. Top management describe themselves as a support function to the organisation, with the mission to, on a high level, give people at SupplyIT the best possible prerequisites to do their jobs. Managers also highlight that they believe the individuals who work closest to the customers have the best knowledge about that specific business, and therefore they should be responsible for making decisions in regards to that. Therefore, the company has decentralised decision-making to autonomous teams.

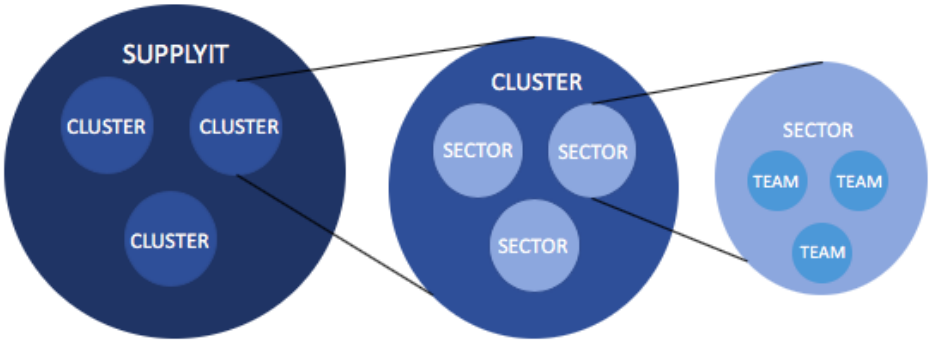

Figure 1. Illustration of SupplyIT's organisational structure.

Innovation is seen as essential to the firm by the top management, which shows through establishment of various innovation initiatives within the firm. One such initiative is Customer Needs Explorer (CNE), which consists of selected innovation ambassadors from different parts of the organisation who get to explore ideas that are of own interest and 'outside of the box'. Another initiative allows everyone in the organisation to bring forward their ideas to a 'product

council', consisting of representatives from the teams in one sector. In the product council, decisions are made on which ideas should be realised and prioritised. There is also an entire sector, called Scout, present at SupplyIT that focuses primarily on radical innovation. Within Scout, a team called Xplore is particularly focused on generating radical innovation by identifying, conceptualising and verifying new business opportunities.

On an overall level, SupplyIT strives to innovate according to a 70/20/10 model. This means that 70 percent of the firm's innovation should be continuous improvements and customer adaptations in their core business, 20 percent new functions to the existing platform, labelled 'growing innovation', and 10 percent radical innovation targeted towards new businesses and business models. Continuous improvements are made mainly in the customer teams, 'growing innovation' in the R&D teams and radical innovation in the Scout sector.

1.3 Academic Contribution and Industry Relevance

The study is conducted within a larger research project funded by the Swedish Governmental Agency for Innovation Systems (VINNOVA) and conducted by Lisa Carlgren during 2018 and 2019, hereafter called 'the Vinnova research project', which is a collaboration between the Research Institutes of Sweden (RISE) and Chalmers University of Technology. The Vinnova research project explores how the use of Design Thinking (DT) can help firms in building innovation capability in practice, while strengthening the project participants' own ability to change. DT can be seen as a set of practices, techniques and mindsets inspired by designers' way of working (Carlgren et al. 2016; Rosenweig, 2011), and the concept is seen as a driver of innovation (Brown, 2008). Three organisations participate in the Vinnova research project, namely SupplyIT and two other large Swedish enterprises. This study makes contributions to both industry and academia by generating knowledge that can be of practical use for SupplyIT, as well as exploring the assessment of innovation capability from a theoretical standpoint. Due to the affiliation with the Vinnova research project, this study also contributes to its findings by enhancing co-learning between the firms involved. The result of this study will therefore contribute, not only to SupplyIT, but also to the other firms involved in the Vinnova research project. Moreover, this study contributes to the Vinnova research project further, by providing in-depth knowledge about SupplyIT and its innovation capability, which serves as valuable input to continuing research.

1.4 Delimitations of the Study

In previous literature it has been argued that different types of innovations are more or less important, and that a greater focus should be dedicated towards the generation of radical innovation rather than incremental (Assink, 2006; O'Connor, 2008). In this study, all types of innovation are deemed relevant and therefore no distinction has been made between a radical or incremental innovation capability. Due to the choice of conducting a qualitative study, a rigorous quantitative assessment of innovation capability has not been attempted. Instead, the study focuses on identifying the underlying elements of innovation capability that enables an assessment, and the challenges involved with measuring these, rather than constructing a tool

for assessment. In turn, this decreases the actionability of the study's results, but on the other hand, it contributes with new insights on what needs to be considered when assessing a firm's innovation capability.

2 Theoretical Framework

The following chapter concerns the theoretical aspect of the study. A literature review on innovation and the concept of innovation capability is first presented and summarised through a comparison of the main existing frameworks of innovation capability. In addition to this, the section highlights alternative perspectives on innovation and how they compare to the capability perspective. Lastly, the chapter ends with theoretical views on innovation capability assessments.

2.1 The Innovation Concept

In today's dynamic and complex markets, it is becoming widely acknowledged that innovation can be considered a source of competitive advantage (Assink, 2006; Lawson and Samson, 2001; Mascitelli, 2000; McDermott and O'Connor, 2002; O'Connor, 2008; Tushman and O'Reilly, 1996). The term 'innovation', as it was first described, refers to the commercial application of any new idea (Schumpeter, 1934). Since then, the definition has been developed in different directions, resulting in incongruence and confusion within the field of innovation research (Garcia and Calantone, 2002; Mascitelli, 2000). During its infancy in the 1950's, the field of innovation studies developed from different research disciplines, including economics, sociology, management, psychology and organisational studies (Martin, 2012). As the research field began to mature, theories from these independent disciplines started to merge (Martin, 2012). Innovation is not to be confused with the term 'invention', since the latter only refers to a new idea, and thus lack the requirement of commercial application (Schumpeter, 1934). Francis and Bessant (2005:171) define innovation in line with DTI (1994) as simply "the successful exploitation of new ideas", whereas other scholars, such as Assink (2006), emphasise the need for value creation.

Scholars distinguish between different types of innovation output, such as product, service, process, technological or business model innovation (Assink, 2006). Innovation can also be seen as a process, and the activities involved in creating innovative output (Crossan and Apaydin, 2010). The term is further defined in line with its expanding collection of paired subsets: incremental versus radical, evolutionary versus revolutionary, sustaining versus disruptive, and continuous versus discontinuous (Mascitelli, 2000). The aforementioned pairs are distinguished based on their respective levels of uncertainty (O'Connor, 2008), paradigmatic effects (Assink, 2006) or degree of newness (Garcia and Calantone, 2002). However, there is no consistent delineation as to how these categorisations are made (Garcia and Calantone, 2002). "While incremental innovations are typically extensions to current product offerings or logical and relatively minor extensions to existing processes, radical product innovations involve the development or application of significantly new technologies or ideas into markets that are either non-existent or require dramatic behaviour changes to existing markets" (McDermott and O'Connor, 2002:424). Both researchers and practitioners tend to focus on radical innovation, and some do not even perceive incremental innovations as being a type of innovation (Crossan and Apaydin, 2010).

Mascitelli (2000:181) acknowledges that "innovations that are unique, original, and unexpected are far more valuable from a competitive standpoint than innovations that are predictable, incremental, or mundane". According to Moss-Kanter (2006), this does not imply that firms should focus all their efforts solely on achieving radical innovation. A sufficient number of incremental innovations can lead to great profits and should therefore not be disregarded (Moss-Kanter, 2006).

In this study, innovation is defined in line with Assink (2006:217) as "the process of successfully creating something new that has significant value to the relevant unit of adoption", which encompasses the full spectrum of innovation subsets.

2.1.1 Innovation Culture

A firm's ability to be innovative is highly dependent on the company culture as the culture affects how creativity relating to new ideas and solutions, is being handled in terms of encouragement and support throughout the innovation process (Martins and Terblanche, 2003). Tushman and O'Reilly (1996) further support this by stating that company culture is a critical factor for a firm's success, and firms with a culture that encourage change, instead of repressing it, are the ones that succeed. Company culture constitutes the specific values, norms and beliefs of a firm, and is affected by organisational factors such as strategy, structure, support mechanisms, and communication (Martins and Terblanche, 2003). Depending on how these factors are expressed, the culture can either foster or hinder innovation to different degrees (Martins and Terblanche, 2003).

Furthermore, Tushman and O'Reilly (1996) state that the culture can function as a competitive advantage if incorporated in the business offer, for example by reaching a service level that is difficult for competitors to match. An open culture that is characterised by cooperation, knowledge sharing and communication across the firm, leads to the feelings of trust and predictability among employees, which in turn motivates and encourages risk taking (Tushman and O'Reilly, 1996). A favourable culture for innovation is characterised by openness, creativity, empowerment, diversity and a tolerance of uncertainty and ambiguity (Assink, 2006; O'Connor, 2008; Lawson and Samson, 2001; Tushman and O'Reilly, 1996).

2.2 Capability Perspective on Innovation

This section brings up the theoretical grounds on which the capability perspective on innovation is founded. Thereafter, the concept of innovation capability is presented followed by a comparison of existing theoretical frameworks of innovation capability.

2.2.1 Organisational Capabilities and the Resource-Based View

Several scholars advocate for a capability perspective on innovation, which is based on the resource-based view (RBV) of firms (Lawson and Samson, 2001; O'Connor, 2008; Björkdahl and Börjesson, 2012). According to the RBV theory, firms gain a competitive advantage from

their collection of resources and capabilities, as opposed to their products or services (Barney, 1991; Prahalad and Hamel, 1990; Wernerfelt, 1984). An underlying assumption of this theory is that firms are heterogeneous rather than homogenous (Barney, 1991). Prahalad and Hamel (1990) focus on organisational capabilities, which correspond to a firm's ability to deploy its available resource. They argue that a firms' competitiveness is derived from the capacity to develop new products. According to Björkdahl and Börjesson (2012:172) "organisational capabilities signify what an organisation is (or is not) able to do." Despite its popularity among both practitioners and researchers, the RBV theory has been criticised for lacking rigorous explanation of how a firm's resources actually bring about a competitive advantage (Priem and Butler, 2001). Barney (1991) highlight that the resources that are most valuable in terms of being a competitive advantage are also the most difficult to identify, making resources inherently difficult to measure. Moreover, Priem and Butler (2001) highlight that the underlying strategic analysis of the RBV is simplified as it makes the implicit assumption that the product market is homogenous, and thus negligible in terms of firm competitiveness. It has also been argued that the RBV is too static in its nature to be able to fully explain the concept of competitive advantage (Teece, 2007; Priem and Butler, 2001).

2.2.2 Dynamic Capabilities

Organisational capabilities that currently create a competitive advantage, can in the future become core rigidities that hamper innovation needed for the firm to remain competitive (Leonard-Barton, 1992; Christensen, 1997). In order to prevent this, Teece et al. (1997) argue that firms need to develop so called 'dynamic capabilities', that have the ability to renew existing ones. Dynamic capabilities are defined as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al. 1997:516). These dynamic capabilities can be seen as second-order capabilities that reside on a higher level, since they create and renew first-order organisational capabilities (Danneels, 2002). The dynamic capability perspective has received significant attention in recent years, but arguably lack a coherent and rigid theoretical foundation (Arend and Bromiley, 2009; Barreto, 2010). Similarly to the RBV, the character of dynamic capabilities makes them difficult to measure. As explained by Arend and Bromiley (2009), dynamic capabilities convey a firm's capacity to change, but the presence or absence of change is not sufficient to determine if dynamic capabilities actually exists.

2.2.3 Innovation Capability

The notion of 'innovation capability' is closely connected to theory on organisational and dynamic capabilities (Assink, 2006; Christensen, 1997; Lawson and Samson, 2001; O'Connor, 2008; Francis and Bessant, 2005). Similarly to the term 'innovation', the concept of innovation capability lacks a unified definition and the concept is often equated to 'innovativeness' or 'innovation performance' (Börjesson and Elmquist, 2011). Crossan and Apaydin (2010) highlight that this lack of clarity in separation may be intrinsically problematic.

An innovation capability can be seen as an organisational capability, but scholars disagree on whether or not it should be considered a dynamic capability (Breznik and Hisrich, 2014). Lawson and Samson (2001:384) define innovation capability as "the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders". This definition portrays innovation capability in line with Danneels (2002) description of a second-order capability, thus suggests that it should be considered as a dynamic capability. Francis and Bessant (2005:172), on the other hand, define it as "an underlying capacity to gain advantage by implementing more and better ideas than rivals", which is more in line with a first-order capability perspective. Scholars in favour of this reasoning argue that an innovation capability is in need of constant reconfiguration and renewal, making it an organisational capability amongst others (Börjesson and Elmquist, 2012; Tidd et al., 2005). Breznik and Hisrich (2014) found that, although commonalities between the two fields exist, there are also inconsistencies and contradictions. Although clarity concerning the term is preferred, this level of ambiguity is deemed acceptable for the purpose of this study. Here, innovation capability is defined in line with Börjesson and Elmquist (2011:174) as "a characteristic of the firm's preparedness and its development of the 'muscles for innovation'". This definition emphasises that innovation capability is differentiated from the notion of innovation performance (Börjesson and Elmquist, 2011).

2.2.4 Theoretical Frameworks of Innovation Capability

There are four main theoretical frameworks of innovation capability in previous literature that will be examined further in this section. The frameworks by O'Connor (2008), Lawson and Samson (2001), and Björkdahl and Börjesson (2012) refer to elements or dimensions of innovation capability, whereas Assink (2006) frame the concept from the opposite perspective by referring to innovation barriers.

Drawing on organisational and dynamic capabilities literature, Lawson and Samson (2001:384) argue that innovation capability "brings together the efficiency of the mainstream with the creativity of the newstream", and that continuous knowledge sharing between these two streams is crucial for the development of innovation capability. To facilitate this development, they propose a construct for innovation capability consisting of seven elements: 1) vision and strategy, 2) harnessing the competence base, 3) organisational intelligence, 4) creativity and idea management, 5) organisational structures and systems, 6) culture and climate and 7) management of technology.

In an attempt to better understand how firms can improve their innovation capability, Assink (2006) identify five main barriers for disruptive innovation and investigate their interrelationship and interdependence. These barriers relate to; 1) the existence of a successful and dominant product or business model, 2) an inability to unlearn obsolete mental models, 3) a risk-averse corporate climate, 4) innovation process mismanagement and 5) lack of mandatory infrastructure and adequate follow-through (Assink, 2006).

O'Connor (2008) adopts a systems approach and proposes a framework for building major innovation capability consisting of seven elements. These are; 1) an identifiable organisational structure, 2) internal and external interface mechanisms, 3) exploratory processes, 4) requisite skills and talent development, 5) governance and decision-making mechanisms on multiple levels, 6) appropriate performance metrics and 7) a suitable culture and leadership context. The systems approach implies that the elements are interdependent, which stresses the importance of taking all elements into account when attempting to build innovation capability (O'Connor, 2008). Building on this framework, O'Connor et al. (2008) emphasise that someone needs to be held responsible for the firm's innovation efforts and stress the need for a management system for innovation that ensures that decision-making and execution moves beyond the original founder to reduce the risk of losing the innovation capability.

Drawing on existing literature on innovation capability, Björkdahl and Börjesson (2012) present a framework for innovation capability. The framework consists of the following eight dimensions: 1) strategy for innovation, 2) prioritisation, 3) culture, 4) idea management, 5) external environment and linkages, 6) implementation, 7) systems and decision rules and 8) organisational context and learning (Björkdahl and Börjesson, 2012). Similarly to O'Connor (2008), Björkdahl and Börjesson (2012) also advocate for a systems perspective on innovation, highlighting the interdependence of the elements.

An overview of the aforementioned frameworks of innovation capability is displayed in table 1. A common denominator for all theoretical perspectives in this comparison is that they are based on studies of large firms. O'Connor (2008) and Assink (2006) focus on radical innovations, by arguing that this type of innovation is what generates the growth and renewal of a company. Lawson and Samson (2001) and Björkdahl and Börjesson (2012) instead focus on both incremental and radical innovation, hereafter labelled 'general innovation', in order to not exclude any types of innovation. The difference between these two approaches is that the frameworks of O'Connor (2008) and Assink (2006) assume a high risk and uncertain environment, which O'Connor (2008) argues require a different approach than lower risk environment when managing innovation. Tushman and O'Reilly (1996) state that as firms grow larger, the required structures and systems lead them to become increasingly risk-averse. It is therefore more difficult to generate radical innovation in large firms (Tushman and O'Reilly, 1996), which could explain why O'Connor (2008) and Assink (2006) chose to only focus on radical innovation.

Table 1

Constituents of innovation capability from different theoretical perspectives

Lawson and Samson (2001)	**Assink (2006)**	**O'Connor (2008)**	**Björkdahl and Börjesson (2012)**
General innovation	*Disruptive innovation*	*Radical and really new innovation*	*General innovation*
Elements of innovation capability	*Barriers for disruptive innovation*	*Elements of major innovation capability*	*Dimensions of innovation capability*
Vision and strategy	Risk barrier	Governance and decision-making mechanisms	Strategy for innovation
Culture and climate	Mindset barrier	Suitable culture and leadership context	Culture
Creativity and idea management	Nascent barrier	Exploratory processes	Idea management
Organisational structures and systems	Infrastructural barrier	Identifiable organisational structure	Systems and decision rules
Organisational intelligence	Adoption barrier	Internal and external interface mechanisms	External environment and linkages
Harnessing the competence base		Requisite skills and talent development	Organisational context and learning
Management of technology		Appropriate performance metrics	Prioritisation
			Implementation

Some reflections on table 1 are worth mentioning. Firstly, company culture, organisational structure, creativity/mindset, competence and knowledge creation are elements that are mentioned by all authors. These are either presented as parts of elements or as elements in themselves. Moreover, the element 'vision and strategy' is only highlighted in the frameworks that are focused on general innovation. However, it can be considered a part of O'Connor's (2008) 'suitable culture and leadership context', and Assink (2006) mentions that the company strategy needs to include the development of a disruptive innovation capability. Furthermore, Lawson and Samson (2001) consider the 'existence of a network' as being part of the context

rather than an element in itself, whereas this is included as a constituent in the frameworks developed subsequently, either in terms of learning or cooperation.

Table 1 consists of theories that all promote a systems approach to innovation capability, highlighting the interrelations between the elements. By adopting a systems perspective on innovation, the complexity of the construct increases since considerations have to be made both for each element, but also for the interplay between them (O'Connor, 2008). Systems theory further highlights that the characteristics of one element can change when another element is added (O'Connor, 2008) Hence, the system's characteristics must be understood from combining the elements, and not only by investigating the behaviour of each separate element.

2.3 Alternative Perspectives on Innovation

One of the main critiques of the capability literature is that it is overly abstract and on too high of a level to be actionable for practitioners (Schreyögg and Kliesch-Eberl, 2007; Crossan and Apaydin, 2010; Björkdahl and Börjesson, 2012; Carlgren, 2013). Crossan and Apaydin (2010) highlight that innovation researchers commonly only focus on one dimension of innovation, which is usually dependent on the level of analysis. The RBV is primarily used at the organisational level of analysis, whereas economic theories are often applied at the societal level, and psychological theories at the individual level (Crossan and Apaydin, 2010). To highlight the advantages and shortcomings of the innovation capability perspective, some examples of alternative perspectives on innovation follow.

2.3.1 Network Approach

In recent years, different types of network approaches to innovation have become popular. The focus of network theories is the effects of a firms' relationship with others (Burns and Wholey, 1993), and such analysis is primarily conducted on a macro-level (Crossan and Apaydin, 2010). A common denominator for these theories is that they often focus on the knowledge management of firms (Martin, 2012). Drucker (1993) argues that humanity has entered the 'knowledge society' where value is created through productivity and innovation, and the primary source of competitiveness is knowledge. In order for firms to maximise their knowledge base, innovation research suggest that they must look beyond their organisational boundaries (Saxenian, 1994; Powell et al., 1996; Chesbrough et al., 2006; Björk and Magnusson, 2009).

In her analysis of regional performance differences, Saxenian (1994) points to the benefits of having a regional network that promotes collective learning and encourages experimentation and entrepreneurship. Powell et al. (1996) also promote a network perspective and argue that the locus of innovation is found in networks of learning instead of single firms in industries that are characterised by rapid technological development. 'Open innovation' is a concept that originates from the same theoretical perspective (Martin, 2012). Here, useful knowledge is assumed to reside both inside and outside the organisational boundaries, and firms must learn how to identify, connect to, and leverage the external sources (Chesbrough et al., 2006). Hence,

it is not enough for firms to only create value; they must also capture value in order to achieve sustained competitiveness (Chesbrough et al., 2006). In terms of idea generation, Björk and Magnusson (2009) show a clear interrelationship between high quality innovation ideas and network connectivity.

Despite being different branches within the field of innovation studies, the network approach and capability perspective share similarities. For example, Leonard-Barton (1992) argues that firm core capabilities are knowledge sets, which reside within the viewpoint of innovation network researchers. On an organisational level, the benefits of networks are highlighted by several innovation capability advocates (Lawson and Samson, 2001; O'Connor, 2008; Björkdahl and Börjesson, 2012). However, Börjesson and Elmquist (2012) argue that the entire system must be addressed in order to determine a firms' innovativeness. In line with this argument, the network approach is deemed too narrow to encompass the full system influencing innovativeness. On a macro-level, on the other hand, links to innovation outcomes and firm's performance are too weak and further theoretical development is needed (Crossan and Apaydin, 2010).

2.3.2 Micro Foundations

Felin and Foss (2009) argue that when collective factors are chosen as the focus of organisational analysis, individuals are implicitly assumed to be homogenous and negligible to the outcome. Felin and Foss (2005:441) call attention to the fact that organisations are made up of individuals and state that "this elementary truth seems to have been lost in the increasing focus on structure, routines, capabilities, culture, institutions and various other collective conceptualisations in much of recent strategic organisation research". They call for increased theory that is transparently rooted in individual action and interaction to explain higher-level outcomes. Other researchers support this and argue that the complexity of innovation is best understood at the micro level since it reveals the practises, mechanisms and actors behind the capability (Abell et al., 2008; Cantarello et al., 2012). The following sections will therefore comment on various theories that relate to innovation capability and clearly link to the underlying micro foundations.

2.3.2.1 Psychological Safety

Several studies have shown that a high degree of psychological safety in teams stimulate innovation (Newman et al., 2017), and Kessel et al. (2012) found that it is a significant predictor of performance in creative teams in particular. Psychological safety has its base in organisational learning theory and refers to a work environment in which employees feel safe to voice ideas, take risks, collaborate and exchange honest feedback (Edmondson, 1999). It is a concept that has been studied extensively at the individual and team level, but also at the organisational level (Newman et al., 2017). At the organisational level, Baer and Frese (2003) found that an organisational climate with high degree of psychological safety is a prerequisite for innovation. Furthermore, Carmeli (2007) demonstrate that psychological safety enhances the failure-based learning behaviours of employees in organisations. At the individual and team level, psychological safety also contributes to improved communication outcomes and

increased knowledge sharing among individuals (Newman et al., 2017). In addition, Chandrasekaran and Mishra (2012) discovered that the psychological safety of autonomous teams is negatively correlated to the level of exploration in their process, which is in contrast to previous findings indicating that team autonomy has a positive effect on psychological safety. They also found that a clear connection between the objective of the autonomous team and the overall objective organisation increases the psychological safety of the team. These findings provide insights into how enabling factors of innovation can be studied on a team level and connected to firm level outcomes.

2.3.2.2 Creative Climate

Ekvall (1997) argues that in order to understand innovation, one must first understand the processes and conditions of creativity, since individuals' creative ideas are the starting point of any innovation. A firm's climate is defined as "the recurring patterns of behaviour, attitudes, and feelings that characterise life in the organisation", and is distinguished from culture in that it is more directly observable (Isaksen et al., 2001:172). Thus, the creative climate of a firm is one that promotes the generation, consideration and use of innovations (Isaksen et al., 2001). Creative climate is perceived by people within an organisation, and therefore naturally occur on an individual level (Björkdahl and Börjesson, 2011). But on an aggregated level these perceptions also form an attribute of the firm, namely the organisational climate, which exist independently of the individual perceptions (Isaksen et al., 2001). For example, the firm-level element of 'risk taking' is perceived on an individual level as individuals' confidence to 'gamble' on their ideas (Isaksen et al., 2001). Creative climate is a prerequisite for firm innovativeness, but Björkdahl and Börjesson (2011) argue that it is not a sufficient characteristic for innovation as it fails to consider other influencing factors. As was mentioned previously, the organisational structure widely acknowledged as one such influencing factor (Lawson and Samson, 2001; Assink, 2006; O'Connor, 2008; Björkdahl and Börjesson, 2012).

2.3.2.3 Practise-Based View

A theory that combines individual and firm level perspectives on innovation is the practice-based view (PBV) (Crossan and Apaydin, 2010). In the theory of practise, Whittington (2006) identifies three elements of innovation that can be isolated. These are practise, praxis and practitioners. Practise is what practitioners know, whereas praxis is what they actually do (Crossan and Apaydin, 2010). The PBV considers the actions taken by people in the organisation, the espoused theories that guide these actions, the consequences of the actions on organisational outcomes, as well as the related feedback loops (Crossan and Apaydin, 2010). Although believed to be a fruitful approach, Johnson et al. (2003) argue that the PBV does not replace conventional theories such as the RBV, but instead functions as a complement. The PBV offers a new approach on how to make sense of the complexity of innovation by grounding the abstract concept in the actions of people, which can be explained through the connections between practise, praxis and practitioners (Whittington, 2006; Crossan and Apaydin, 2010).

2.4 Assessing Innovation Capability

Over the years, innovation scholars have developed different methodological tools for measuring innovation (Martin, 2012). Some of the most influential tools were developed by early innovation pioneers in the 1960's, and these tools use patents as an indicator for innovative activity (Martin, 2012). These early assessment tools reflect the view on innovation at the time which was predominantly focused on technology, patents and R&D in large manufacturing firms (Martin, 2016). Today's view on innovation is more inclusive, however, Martin (2012) highlights that in spite of this, no subsequent methodological publications have reached the same level of citations as the early works. He points out that innovation scholars seem to lack consensus on which pioneering papers to refer to. As a consequence, the field of innovation research is more fragmented and heterogeneous than other established social science disciplines (Martin, 2012). Existing measurement tools tend to be built around outdated innovation indicators, and therefore fail to capture unconventional innovation activity (Martin, 2016).

The fragmentation and complexity of the innovation research field has led to an increasing number of practitioner-based measures of innovation, most of which lack theoretical grounds (Crossan and Apaydin, 2010). Although researchers have shown that innovation leads to firm performance, they have not fully understood how this happens (Crossan and Apaydin, 2010). Management scholars argue that a firm's innovation capability is the most important determinant for firm performance (Lawson and Samson, 2001; Björkdahl and Börjesson, 2012) and this argument has been supported by several empirical studies (Cooper and Kleinschmidt, 2000; Calantone et al., 2002; Börjesson and Elmquist, 2011). However, due to the fragmentation of the research field, empirical studies focus on different types of innovation and use different measurements, making generalisation practically impossible (Crossan and Apaydin, 2010).

2.4.1 Innovation Capability Assessment Tools

Theoretical frameworks for assessing innovation capability are scarce (Björkdahl and Börjesson, 2011) and most of them originate from literature on innovation audits (Björkdahl and Börjesson, 2012). Innovation audits assess firms' innovation capability by comparing actual practice to common best practice (Björkdahl and Börjesson, 2012). One of the most well-known innovation audits was developed by Chiesa et al. (1996) and aims to assist firms in identifying gaps between their current practise and best practice, as well as explain the reasons as to why these gaps exist. This is achieved through a rapid assessment using innovation scorecards and an in-depth audit based on a literature review (Chiesa et al., 1996). Innovation scorecards describe the characteristics of good and poor innovation practices, and people get to assess their organisations for each statement using a four-point Likert scale ranging from unsatisfactory to good (Chiesa et al.,1996).

Likert scales are used for the majority of innovation capability assessment tools (Tidd et al., 2005; O'Connor et al., 2008; Chiesa et al., 1996; Björkdahl and Börjesson, 2011); however, the focus of the tools differs drastically. Chiesa et al. (1996) focus on the subset of technical

innovation management, whereas Tidd et al. (2005) assess innovation management in general. O'Connor et al. (2008) on the other hand, assess the full management system of innovation capability, but only for radical innovation. Björkdahl and Börjesson (2011) highlight that no existing framework allows for a complete assessment of firms' innovation capability and develop one in response. However, they emphasise that further research is required to validate their instrument.

2.4.2 Assessment tools for Psychological Safety and Creative Climate

There are however some assessment tools recognised for their robustness. A quantitative assessment tool that is based on qualitative work and has been subjected to extensive validation tests, is Edmondson's (1999) 7-item scale that was developed to measure team psychological safety (Newman et al., 2017). The assessment tool is based on rigorous scale construction protocols and includes items that capture the shared perceptions of team members in regards to psychological safety (Edmondson,1999).

Another assessment tool more closely connected to innovation capability, which also demonstrates a high degree of academically validated evidence, is Göran Ekvall's questionnaire on creative climate (Isaksen et al., 2001). The creative climate questionnaire (CCQ) covers ten dimensions; 1) challenge, 2) freedom, 3) idea support, 4) trust, 5) dynamism, 6) playfulness, 7) debate, 8) conflicts, 9) risk taking and 10) idea time. All dimensions except conflicts correlate positively to organisational creativity and innovativeness (Ekvall, 1996). Creative climate is distinguishable on both an individual and a firm level, and as Isaksen et al. (2001) showed, the CCQ can be used to assess both. This suggests that the CCQ is a tool that can be used on to assess organisations on a multi-level. However, as argued by Björkdahl and Börjesson (2011), the creative climate is only one factor enabling firm innovation, and therefore a more comprehensive assessment tool is needed to capture all elements of a firms' innovation capability.

2.4.3 Disadvantages of Measuring Innovation Capability

From the above, it can be concluded that existing assessment tools and frameworks are either narrowly focused on subsets of innovation capability or lack preferable levels of academic rigour. Innovation is a complex construct (Crossan and Apaydin, 2010), and Cording et al. (2010) have found that complex theoretical constructs are particularly challenging to measure. They explain that measurements for complex constructs often only manage to capture one of several interdependent dimensions of the construct. As a consequence, it allows researchers to develop measures that best fit their theoretical arguments (Cording et al., 2010).

In turn, this greatly reduces the level of confidence that can be given to the theoretical substance of the measurements and findings (Cording et al., 2010). Similarly, Goldman (1990) argues that the seeming precision and rigour of standardised tests are often exaggerated, and that they often fail to account for the ambiguities of the instruments. In particular, he questions the unfounded assumption that the test subjects fully and consistently understand the meaning of the statements

presented in the assessment tools. This provokes the question on whether or not the field of innovation studies has reached a level of understanding to adequately develop a comprehensive measurement for innovation capability. Alternatively, a qualitative assessment approach could be preferred.

2.4.4 Qualitative Assessment

Unlike their quantitative counterparts, qualitative means of assessment do not comprise of standardised test, and therefore do not provide for normative comparison (Goldman, 1990). On the other hand, this also entails that they are not restricted by a preconceived classification system (Goldman, 1990), which can be considered beneficial when investigating complex constructs. Qualitative assessments are focused on understanding a particular phenomenon through people's experiences, and the results are often only applicable to specific contexts (Patton, 2002). Although this is a disadvantage in terms of the academic requirement of generalisability, the results often prove valuable to the participants (Easterby-Smith et al., 2015). Examples of tools for qualitative assessment include interviews, observations and workshops (Easterby-Smith et al., 2015). The aim of qualitative assessment is to stimulate the interest and involvement of the participants, and it is not uncommon that results are co-created (Easterby-Smith et al., 2015).

In comparison to quantitative outcomes, qualitative results are of a vaguer character (Goldman, 1990). Different types of visualisation tools such as charts, graphs, storytelling and metaphors, are commonly used to assist people in understanding obscure information (Liedtka, 2015). According to Lakoff and Johnson (1985), the visualisation tool of metaphors helps people make sense of their past experiences and guide them towards future ones. This suggest that visualisation of qualitative results can reduce their perceived ambiguity and make them more actionable.

Goldman (1990) argues that qualitative assessment is to be preferred in many cases since it allows participants to take an active role in collecting and extrapolate meaning out of data, as well as provide a holistic understanding of the issues at hand. Moreover, he believes that qualitative assessment is most appropriate in group settings where individuals are able to share knowledge, and when the purpose of the assessment is to learn how to drive internal development. According to Björkdahl and Börjesson (2012), the purpose of assessing innovation capability is to identify problems and opportunities that the firm experience in relation to innovation, and thereby assist the firm in building its innovation capability. This suggests that a qualitative approach could be suitable to achieve the purpose of an innovation capability assessment.

3 Methodology

In this chapter, the methodology used throughout the study is presented. First, the research approach and design are discussed, followed by the research method and lastly, the quality of the research is addressed.

3.1 Research Approach and Design

The research design specifies the courses of actions when collecting and analysing data to appropriately fulfil the goal of the research (Easterby-Smith et al., 2015). This thesis arose from the company SupplyIT's desire to assess their innovation capability, in addition to the interests of the authors within the field of innovation work. A qualitative single-case study research design was therefore adopted to achieve the goal of the study. A single-case study is preferred when a single organisation is being studied over a certain period of time and to gain richer data and a better understanding of the context in which the firm is present (Easterby-Smith et al., 2015). In this case, the object of investigation is the company SupplyIT, and the study has been conducted during the Spring of 2019. By conducting a single-case study, an in-depth data collection and analysis have been doable, which not would have been possible with more companies included since the time of the study was limited. SupplyIT requested a research on how to assess the firm's innovation capability to facilitate the building of said capability. Due to the complex nature of innovation capability (Crossan and Apaydin, 2010), and the field of research being nascent (Carlgren, 2013), a qualitative approach to the study was preferred. The qualitative approach enables an explorative research, where the understanding and analysis of a context is developed from an interpretation of social constructions (Maxwell, 2013). As such, the qualitative approach enables the understanding of the meaning of things, events and actions of people being investigated (Maxwell, 2013).

Furthermore, this study aims to serve as a contribution to both the organisation and to academia. This has been achieved by combining theoretical analysis from the innovation capability theory, and empirical findings from the qualitative single-case study at SupplyIT. The study has been conducted within the larger Vinnova research project involving three companies, of which SupplyIT is one. Insights from all organisations have been shared during meetings and workshops throughout the course of the Vinnova research project, and the results of this in-depth study will be shared with all participating companies. For an overview of the research process, see figure 2.

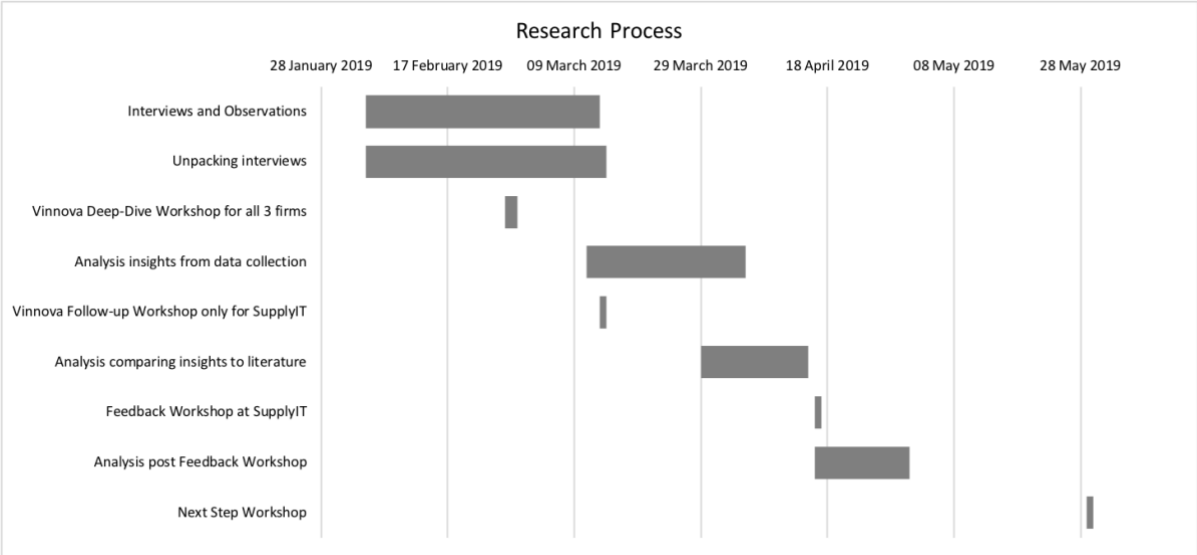

Figure 2. Overview of the research process during Spring 2019.

3.2 Research Method

The methods chosen for this study include semi-structured interviews with selected firm representatives, along with observations of specific innovation related meetings and conversations. A reason for conducting semi-structured interviews in qualitative research is to include both facts and personal reasoning and feelings (Tracy, 2013). When conducting a qualitative study, Maxwell (2013) states that the method should enable collaborative and close contact between the studied object and the researcher, in order to assimilate a sufficient level of understanding about the unit of analysis. The chosen methods for this study are seen to enable the desired amount of personal connection needed to gain insights. The interviews were the primary data collection method used for the study, whereas observations were made to complement the interviews.

Initially, team Xplore was identified as the study's unit of analysis, based on the perception that the team was the firm's main source of innovation. However, during the initial interviews it became clear that the entire organisation needed to be included in the scope of analysis, which lead to a re-evaluation. The main reason behind this change in scope was to include all stages of the innovation process, and not simply the initial ones that team Xplore is involved in. Hence, additional semi-structured interviews were conducted with people from different parts of the organisation.

When conducting semi-structured interviews, questions are not specified according to a predefined structure (Bryman and Bell, 2015). Instead, open questions are asked to allow the interviewees to steer the conversation in their preferred direction and focus on topics of their interest (Bryman and Bell, 2015). As a result of this, topics will vary between the interviews. The direction of the interviews should, however, be kept in line with the predefined guidelines and questions stated in the interview template, in order to reflect topics that are relevant for the study (Bryman and Bell, 2015). The questions in the initial interview template for this study

were of a general character to cover a wide array of potentially interesting topics. Once a better understanding of the firm's innovation work had been gained, the interview template questions were further specified and grouped into key topics. Organising interviews in this order, namely initiating with opening questions, followed by key topics and concluding with closing questions, is promoted by Easterby-Smith et al. (2015). Furthermore, they encourage that interview templates are updated as data is gathered, so that the interviews better reflect the topics of interest. These types of revisions were made during the data collection of this study, and content that was no longer considered relevant was removed from the interview template.

Observations were also conducted during this study to better understand the specific innovation contexts mentioned during the interviews. Two meetings were observed, one between team Xplore and top management, and one between team Xplore, a customer and a representative from the customer team at SupplyIT. In addition, some impromptu observations were made of informal conversations at the coffee machine during the time spent at the company. The authors' role during these observations have been what Easterby-Smith et al. (2015) describe as 'observers-as-participants', which implies being passive with the intention of understanding rather than influencing.

3.2.1 Data Collection and Analysis

The following section presents the chosen methods for data collection and qualitative analysis that have been conducted in this study. These have been chosen based on Yin's (2014) recommendation that case studies should be executed using multiple data collection methods, since similar convergence in multiple sources of evidence leads to a more convincing and accurate study (Yin, 2014).

3.2.1.1 Data Collection

As previously stated, both interviews and observations have been used to collect data in this study. The semi-structured interviews were conducted with eighteen representatives from SupplyIT. The description of the interviewees' roles within the firm, the distribution of interviews between these roles, and the length of the interviews are presented in table 2.

Table 2

Role description of the eighteen interviewees and the length of the interviews

Role description	**Number of interviewees**	**Length of each interview**
Top Management	Two	30 minutes
Delivery Manager	Two	60 minutes
Application Specialist	Four, of which two are involved in CNE and two in team Xplore	60 minutes
Business Architect	Five, of which two are involved in CNE and one in team Xplore	60 minutes
Project Leader	Two	60 minutes
Data Scientist	One	60 minutes
Interaction Designer	Two of which one is involved in team Xplore	60 minutes

The interviews aimed to address how the interviewees view innovation and a firm-level innovation capability in general, in addition to how they perceive SupplyIT's innovation efforts, and the supporting or hindering factors that exist within the firm. All interviews were conducted face-to-face at SupplyIT's head office. The first two interviews were conducted with representatives from top management, and these interviews aimed to generate a general understanding of the company and the reasoning behind the desire to assess its innovation capability. The following interviews were conducted with all the members of team Xplore, including the company supervisor for this study. Maxwell (2013) states that the relationship between researcher and participant is complex and changes over time, which is something to consider since it can affect the study, particularly in regards to participant selection and data collection. The company supervisor recommended all initial interviewees in this study. Thereafter, the interviewees were asked to recommend other potential interviewees, preferably individuals that they believed had a contrasting point of view to themselves, or individuals who work in a different part of the organisation to them. This method is known as the snowballing method (Emmel, 2013), and was used to broaden the perspectives of the study. As was shown in table 2, this method resulted in data being gathered from representatives with various roles that work in different parts of the firm, in addition to the initial in-depth understanding of team Xplore. Studies is enriched when they include company representatives from as many different functions as possible when conducting interviews, since it allows for different perspectives to be gathered (Eisenhard and Graebner, 2007).

The execution of the interviews followed a similar pattern, where one interviewer asked the majority of the questions from the interview template, and added follow-up questions, while

the other interviewer took extensive notes. In addition, the audio of the interviews was recorded since all interviewees consented. Easterby-Smith et al. (2015) highlight that recording interviews can have a negative effect on the study, since interviewees might feel inclined to leave out valuable information. However, the positive effects of using audio recording can be seen as exceeding the negative, since it gives the interviewer the possibility to listen to the interview again and adjust misinterpretations, which in turn strengthen the analysis of the data. Moreover, the interviewees recorded their personal reflections directly after conducting each interview, in order to capture insights that could not be understood from listening to the audio recordings.

Further, four workshops were conducted during the study, as shown in figure 2. First, a '*Deep-Dive Workshop*' with all three companies within the Vinnova research project was conducted over a period of two days, facilitated by the researcher responsible for the Vinnova research project. During this workshop, company representatives shared a specific innovation challenge their firm was facing, and the workshop participants developed suggested solutions for each of these challenges. The authors acted as participants in this workshop, and their reflections of the workshop were recorded at the end of each day.

Second, a '*Follow-up Workshop*' was held with the representatives from SupplyIT as part of the Vinnova research project, in which the authors were observing and actively participating in developing the suggested solution formulated during the deep-dive workshop. The solution was further concretised through discussion and the workshop resulted in an action plan for how to create an engagement phase, as opposed to project handovers, at SupplyIT.

The third workshop was conducted specifically for the purpose of this study, where the objective of this '*Feedback Workshop*' was to confirm and discuss the study's findings, as well as testing and discussing the assessment of SupplyIT's innovation capability. The feedback workshop was conducted with thirteen out of the eighteen interviewees. First, the authors presented the findings after which the participants discussed the findings in smaller groups, and later shared their reflections with all participants. Prior to the workshop, the authors had developed a prototype for a quantitative assessment tool in the form of a questionnaire that was based on the findings of the study. There were three main reasons for using the quantitative assessment tool during the feedback workshop: first, to see whether or not the authors' perceptions of SupplyIT's innovation capability matched the perception of the participants, second, to facilitate discussion of the findings, and third to identify benefits and drawbacks of using a quantitative tool for assessing innovation capability. During the feedback workshop the authors both observed how the participants used the quantitative assessment tool and asked for feedback on how they perceived it. By having the participants forming opinions on statements regarding the findings using a Likert scale, and allowing for explanatory comments, the authors could discern indications regarding the validity of the findings more efficiently and systematically. Moreover, the discussion during the feedback workshop highlighted areas of improvements in relation to SupplyIT's innovation capability.

The fourth workshop, named the '*Next Step Workshop'*, was conducted with representatives from SupplyIT as part of the Vinnova research project, and the focus of the workshop was the result of this study. During the workshop, the participants discussed how SupplyIT can continue working with the results of this study in terms of concretising actual goals, responsibilities and participation in regards to the assessment of the firm's innovation capability. As such, the next step workshop aimed at anchoring the results of this study within the firm.

3.2.1.2 Empirical and Theoretical Data Analysis

To be able to understand and interpret the collected data, a grounded analysis approach has been chosen that consists of seven steps, namely familiarisation, reflection, open coding, conceptualisation, focused re-coding, linking and re-evaluation (Easterby-Smith et al., 2015). These steps were used to a varying degree in the analysis phase of the study. The analysis phase was also influenced by DT methods, mainly through visualisation techniques and tools for findings patterns in the data (Liedtka, 2015).

Preparation of data is needed before initiating the analysis phase in order to get an overview of the gathered data (Easterby-Smith et al., 2015). This is achieved through transcribing audio recordings and organising data into manageable structures (Easterby-Smith et al., 2015). In order to develop a rich and well-conducted study, it is crucial to prepare the data both during and after the data collection phase (Corbin and Strauss, 2008). During the interview process extensive notes were taken as well as audio recordings that were compiled and organised in an accessible way so that they could be used for analysis. The two first steps of the grounded analysis, in which the researchers reflect over the focus of the study, familiarise themselves with the data, and get an overview of what type of data is available (Easterby-Smith et al., 2015), were thereby combined.

In the following open coding step, chunks of data are being concretised into short phrases by asking what the data is about, whose point of view it is and how it is being expressed (Easterby-Smith et al., 2015). In practice, interviews were 'unpacked' in two sections, and visual methods were used to facilitate pattern finding in the large amount of qualitative data gathered, which are commonly used DT approaches (Liedtka, 2015).

During the first unpacking session, the audio recordings of the reflections made after each interview by the authors themselves were played back. Following that, 'persona boards' were created, that consist of insights written on sticky notes attached to several pieces of A4 paper, where each piece of paper represents an individual interviewee, see figure 3 in Appendix C.
Subsequently, the second unpacking session was conducted in which the full audio recordings of the interviews were played back and the persona boards insights were complemented, corrected and refined. Corbin and Strauss (2008) state that writing insights on memos is a way of using open coding, and they recommend researchers to use this method and reflect on the gathered data. After the two unpacking sessions, the insights were visualised and qualitatively analysed which resulted in them being structured into 33 different themes. The authors conducted the qualitative analysis by clustering insights in different ways with the purpose of identifying patterns in the data.

Thereafter, commonly used DT methods, such as journey mapping and two-by-two matrices (Liedtka, 2015) were used to analyse the data further. Journey mapping can be used for data analysis since it enables a deeper understanding of users' actions and feelings, whereas two-by-two matrices can be used to find patterns in data by clustering insights along different dimensions (Liedtka, 2015). The journey maps were created by visualising the actions, feelings and events experienced by people working with innovation at SupplyIT. These were created from three different perspectives, namely the perspective of a person working with CNE, a new employee working in a customer team, and an individual from team Xplore, see an example of a journey map in figure 4 in Appendix C. The journey maps were created to gain a deeper understanding of the different experiences that employees at SupplyIT are faced with in regards to innovation work. Moreover, a two-by-two matrix was created for one of the 33 identified themes since its content was deemed too ambiguous, see figure 5 in Appendix C. The insights from this theme were clustered along the dimensions 'internal/external view', and 'positive/negative'. Patterns found in the matrix were noted as insights. Easterby-Smith et al. (2015) refer to this method of analysis as the conceptualisation step. The use of several different methods for handling and clustering insights that are grounded in data, enriches the outcome of the analysis and avoids the potential negative effects of not fully understanding the interviewee (Corbin and Strauss, 2008).

Further, the step of focused *re-coding* is an iterative way of working where established codes are checked against original data and re-coded, which brings about a more in-depth analysis (Easterby-Smith et al., 2015). In the study, this step was conducted by checking the identified themes against original data, which enabled the authors to narrow down the 33 themes to 31 themes. This was followed by further re-coding, resulting in more concrete insights for each theme, see figure 6 in Appendix C for the theme clustering session. To gain an in-depth understanding of the findings, the study included the *linking* step (Easterby-Smith et al., 2015), where the innovation capability perspective was taken into account when analysing the insights. By making this link, the insights could be narrowed down further into eight elements of innovation capability. In addition, these eight elements were concretised into statements describing how to increase the firm's innovation capability. As a result of the literature study that was conducted simultaneously, the element of external network was added based on its significance in previous literature, resulting in nine elements, namely *vision, culture, top management support, prioritisation, idea management, implementation, external network, organisational structure and innovation group*.

It was deemed suitable to complement the analysis with existing literature on the subject of innovation capability in order to add a theoretical perspective on the findings. Four main theoretical frameworks of innovation capability were identified and compared with the findings from SupplyIT. Two of the frameworks focus solely on radical innovation, whereas the remaining two include both radical and incremental innovation. The studies that these frameworks are based on have all been conducted at large firms and are analysed on a firm level. The grounded analysis steps 'open coding' and 'conceptualisation' (Easterby-Smith et al., 2015) were conducted, which resulted in clustering of key insights found in the

corresponding articles. Elements brought up by more than one theory were included in the final ten elements describing innovation capability from a literature point of view, which is seen in Chapter 2.

The eight elements developed from SupplyIT's data were compared to the ten elements from theory. A comparative analysis was made from two different perspectives, one where the company's elements were mapped onto the theoretical element and vice versa, see Appendix B. By comparing the data from two perspectives, different results could be identified that led to further insights. The comparative analysis resulted in the element of external network being added to the eight elements as mentioned previously.

The re-evaluation step, as described by Easterby-Smith et al. (2015), is when external parties make comments of the work in order to identify areas where extended work is needed and to ensure that correct elements have been analysed. In the study, this was done by conducting the feedback workshop mentioned previously. Having employees confirming the validity and relevance of the elements, in addition to the elements being highlighted by several people during data collection, strengthen the result since it ensures that the identified elements are valid with casual effect on innovation capability. The nine identified elements were further narrowed down to six elements in response to the feedback from the feedback workshop, namely *vision and strategy, company culture, top management support, idea realisation, external network and innovation support group*. The changes between the nine and six elements include transforming prioritisation, idea management and implementation into idea realisation, since these elements were perceived to be too similar. Furthermore, the element of organisational structure was deemed to be part of the context and not an element per se.

However, after further analysis in collaboration with the supervisor/Vinnova project researcher, the classification of the elements was discussed in terms of a broader context than SupplyIT. The supervisor has experience working with innovation capability in other firms from previous research projects and provided valuable input into how the elements can be classified. As a result of this analysis, the organisational structure was labelled an element of innovation capability again. Furthermore, the element 'individuals and teams' was added as a separate element and the innovation support group was renamed to the innovation support function. In addition, the element idea realisation was renamed to innovation process, and external network to innovation network, to better reflect the content of the findings. Following several steps of analysis, the eight elements of innovation capability were set, which are presented more in-depth in Chapter 6.

3.3 Quality of Research

When conducting research within an area of interest, the quality of the study is vital to ensure that the results are useful (Easterby-Smith et al., 2015). This concerns all phases in the study, from purpose of the study, data collection, theoretical framing and analysing of the data, to presentation of the results of the research (Easterby-Smith et al., 2015). Tracy (2010) states eight criteria that need to be fulfilled to achieve quality in qualitative research. These criteria

are *worthy topic, rich rigour, sincerity, credibility, resonance, significant contribution, ethical considerations,* and *meaningful coherenc*e. Continuing throughout this section, there will be discussions regarding each of these criteria, connected to this specific study.

Firstly, the criterion *worthy topic* is in regards to conducting research about a relevant and current area of interest (Tracy, 2010). The topic of this study, namely innovation capability and the assessment thereof, lies in the interest of both researchers and practitioners. The topic is current, and although it has achieved a great deal of attention in academia already, more research is needed to fully understand the concept (Crossan and Apaydin, 2010; Martin, 2016). This is why the topic of this study is seen as a relevant and timely area of interest.

Tracy (2010) further states that the choices made relating to methods and the usage of data need to be considered to give the study *rich rigour*. Questions regarding how much data and time in the field is needed, what type of methods that have been used when performing interviews and analysis, and if enough field notes were taken, are crucial in order to maintain a nuanced study (Tracy, 2010). In this study, eighteen interviews have been conducted which is deemed sufficient to reach the goal of the study in accordance with the time frame. If more interviews had been conducted, it would most likely have led to an even more nuanced result since it would have facilitated the disclosure of an increased number of insights. On the other hand, since the study was conducted over a limited time more interviews would have reduced the available time for analysis. Since it was deemed more valuable to achieve in-depth and detailed results, the analysis was prioritised over more data collection. The authors therefore made intentional decisions in regards to the trade-off between time for data collection and time for analysis.

When conducting interviews, the authors considered what questions and follow-up questions to ask, and these questions were continuously updated as knowledge and insights were gained, as recommended by Easterby-Smith et al. (2015). Due to the nature of the chosen method, the authors acknowledge that the result is highly dependent on the questions that were asked during the interviews. This means that the relative importance of certain elements of the result could have been expressed differently if other questions had been asked. On the other hand, the themes and insights that were discovered during the interviews were confirmed by several interviewees and can therefore be seen as rigorous. Moreover, audio recordings of the authors' reflections of what was said during the interview were always conducted directly after each interview. This can be seen as a type of field notes that served as a valuable input to the analysis and significantly increased the rigour of the study since non-audible insights could be captured and stored.

The next criterion highlighted by Tracy (2010) is *sincerity*, which includes self-reflexivity and transparency about the study, both in terms of strengths and weaknesses. During the study, the authors have been open about the goal and progress of the study. They also made conscious efforts to be humble during the interviews to ensure that the interviewees felt heard and confortable with sharing their knowledge and insights. It should be highlighted that the authors decided to not fully transcribe all interviews, but instead take extensive notes, listen to the audio recordings and note down the insights.

The criterion of *credibility* concerns how trustworthy the study is as a base for decisions (Tracy, 2010). Credibility is achieved by thorough and informative descriptions of the participants in the study, triangulation of methods, and feedback from both academic supervisors and company representatives (Tracy, 2010). To make this study credible, several different methods have been used both for data collection and analysis. Interviews and observations were used to gather data and then analysed through the use of clustering, persona boards, journey maps, and two-dimensions matrices. Two supervisors have been present throughout the study to ensure sufficient support and guidance, one representing the studied company and the other representing Chalmers University of Technology. In addition to this, the authors have been in contact with an academic peer that has conducted research on innovation capability and the assessment thereof.

The authors have no previous experience working for the firm under investigation, nor for any other organisation that might have an interest in influencing the result of the study as far as the authors are aware. During the study, the authors have also attempted to separate the actual facts and opinions of the participants from assumptions and interpretations of the facts made by the authors. The attempts include audio recordings of both interviews and reflections in addition to the feedback workshop where the participants validated the findings. However, further credibility could have been achieved if the authors had continued with data gathering for a longer period of time and thereby gained a better understanding of the studied company. In turn, this would have decreased the potential existence of any inaccurate interpretations.

The next criterion Tracy (2010) highlights is *resonance*, which refers to the mutual understanding of the study between the authors and an audience, as well as an interesting presentation of the findings so that it can be used in other settings. In this study, the aim has been to present the findings in a way that can be of value for SupplyIT, and to update the participants with insights along the way to enrich their understanding of the studied topic. The updates were primarily achieved through feedback workshop, but also by keeping in contact with the company supervisor throughout the study.

Furthermore, the criterion *significant contribution* concerns the importance of the study in terms of contribution to academia, theory and/or practice (Tracy, 2010). The goal of this study has been to contribute to both academia and practitioners. The academic contribution has been achieved through enriching existing theory on innovation capability and the assessment thereof by providing insights from the in-depth study. The practical contribution primarily concerns SupplyIT and firms that face similar challenges. This has been achieved by identifying the elements of innovation capability and discussed how these can be assessed, which in turn can be used to assist SupplyIT to take actions for building its innovation capability.

Moreover, Tracy (2010) highlights the importance of a study being *ethically correct*, by maintaining procedural, situational, relational and exiting ethics. Along the study, the authors secured the procedural ethics by not allowing anyone, except for the authors and their university supervisor, to listen to the recordings of the interviewees. This was done to protect the

interviewees by avoiding that any personal and potentially damaging information was being spread. Furthermore, the authors attempted to be as open-minded as possible to the existing framing of the studied organisation studied and to be respectful to all input in the study.

Lastly, the criterion *meaningful coherence* refers to the degree of fulfilment of the goal of study and the connection between findings and literature (Tracy, 2010). To ensure the study's meaningful coherence, the authors have strived to achieve a clear and coherent structure of the study. This has been further strengthened by support and feedback from the university supervisor that has previous experience both within the field of study and academic writing and research.

4 Findings and Analysis

The following chapter presents the findings of the study. The findings consist of two parts: identified elements of innovation capability, and considerations on how to assess these elements.

4.1 Elements of Innovation Capability

Through interviews and observations, SupplyIT's innovation capability could be identified and classified into eight separate elements. These elements are 1) *organisational structure*, 2) *vision and strategy*, 3) *individuals and teams*, 4) *company culture*, 5) *top management support*, 6) *innovation network*, 7) *innovation process* and 8) *innovation support function*, which are illustrated in figure 7. The findings concerning each of these elements are presented below.

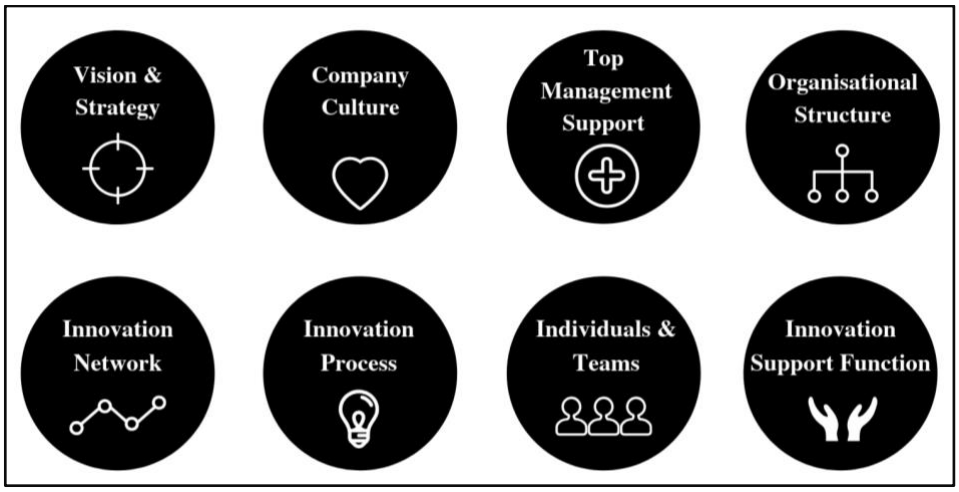

Figure 7. A system of elements of SupplyIT's innovation capability.

4.1.1 Organisational Structure

SupplyIT's flat organisational structure is characterised by decentralised decision-making, autonomous teams and absence of product owners. This structure enables closer relationships with customers, increases agility and removes potential power positions over the products. However, it also poses challenges around communication, cooperation and knowledge sharing between teams, sectors, and clusters. Top management describes the decentralised organisational structure as an important factor in making innovation happen throughout the organisation. For example, by having an R&D team in each cluster, the development of new functions, or so called 'growing innovation', is made closer to the customers, which is seen as a benefit. Moreover, people at SupplyIT believe that the individuals most suited to make decisions are the ones situated closest to the customer or problem. By decentralising decision-making, the autonomous teams get to set their own priorities, which is seen as beneficial since they are deemed the most suitable. Related to the decentralised decision-making, people at SupplyIT also mentioned that the structure allows the teams to be flexible regarding which tools and processes they use. They highlight that since teams are not required to adhere to any a

specific tools or processes, they can choose which tool is the most suitable for their current situation. For example, if parts of a project require exploration, different DT tools can be used, or other methods that might be deemed more suitable.

Although many interviewees mentioned the organisational structure in relation to innovation, one employee highlighted that people at SupplyIT tend to not talk about the disadvantages of their organisational structure. For example, the lack of product owners results in lack of accountability, since no single individual feels personally responsible for a product. Moreover, the decentralised structure also makes communication and knowledge sharing difficult, since teams are far apart. It was highlighted during the interviews that teams occasionally develop similar solutions unnecessarily due to them lacking the knowledge of each other's existence and the potential synergies between the projects. Since the firm is growing rapidly, there is also a concern that the current structure, with its benefits, will need to change to meet the needs of a larger organisation, or that the negative effects of the current structure will increase.

To conclude, people at SupplyIT see the flat organisational structure as beneficial for innovation since it enables teams to set their own priorities and make decisions in close connection to the customers. However, the disadvantages with this structure is that it makes communication and knowledge sharing difficult, as well as resulting in a lack of accountability among employees. Moreover, people at SupplyIT are concerned that the structure with its benefits cannot be maintained as the firm grows, or that the drawbacks will increase.

4.1.2 Vision and Strategy

A topic that was frequently mentioned in relation to innovation during the interviews was the firm's vision and strategy. After realising that people at SupplyIT had a poor understanding of the firm's vision, top management invested a great deal into communicating the vision throughout the firm. The vision was broken down into ten goals, and each team could choose which goal they found the most relevant and interesting to work with. These efforts proved effective, and when asked a year later, the employees had a good understanding of the vision.

However, despite knowing what the vision is, the interviewees perceived that few employees know how to apply the vision and the strategy for innovation in their daily work. The vision and mission that relates to innovation is 'create the future', which is not seen as concrete enough to provide direction. The teams want to have a vision and strategy for innovation that, not only encourage them to work with innovation, but also aid them when making decisions. It was described that employees at SupplyIT do not like the idea of having fixed processes and predetermined routines that all teams must follow, but they still feel the need to have some guidelines for their innovation work. By having the freedom to form own ways of working, and have the vision as a unifying direction, people in the organisation believe that they would be more inclined to pursue their innovation efforts.

It was discovered that one of the issues related to the vision and strategy for innovation, is that the firm lacks consensus on what innovation actually means. Very few of the interviewees

claimed to work with innovation themselves, even though their initiatives would be classified as such according to the definition adopted in this study. These employees were under the impression that innovative ideas have to be radical, or of a technical nature, and some even disliked the term on the basis that 'it does not create customer value'. Others emphasised the need to adopt a broad definition of innovation that includes both incremental and radical initiatives so that everyone in the firm can see how they contribute to innovation. One interviewee explains that a solution that was perceived as a small improvement turned out to be revolutionary in a different context, and that these opportunities are missed when people believe that innovation is something that happens elsewhere. People at SupplyIT stressed that they need to talk about the meaning of innovation more, and discuss it in each cluster, sector and team.

To conclude, people at SupplyIT see that they have a vision and strategy for innovation, but these are perceived as being too ambiguous to guide employees in their daily work. Moreover, there is a lack of consensus within the firm of what innovation actually is, resulting in opportunities being missed because employees assume that innovation happens elsewhere.

4.1.3 Individuals and Teams

SupplyIT focuses greatly on individuals and their personality, motivation and competence when it comes to innovation, and primarily recruit people who feel comfortable with taking responsibility. Everyone in the firm is allowed to work with innovation and is expected to do so to different degrees depending on their role in the organisation. People explain that they feel empowered to pursue their ideas, and that there is nothing in the organisation that hinders these efforts. On the other hand, there is nothing in place that supports individuals in driving their ideas, which puts a great deal of responsibility on individuals. This results in many promising ideas not being implemented, since the innovators might lack the motivation, knowledge or ability to see them through.

Moreover, despite feeling trusted by top management to make decisions, several employees lack confidence and seek out top management's approval before acting. Although employees are empowered to make decisions, their lack of confidence hinders them. A reason for this that was highlighted during the interviews, relates to the lack of consensus of what constitutes innovation. Since many employees do not consider themselves to be innovators, they lack the confidence to pursue their ideas. Another reason that was presented, is that many of the new recruits are young and newly graduated, which could explain their uncertainty. New recruits are commonly assigned to customer teams, resulting in them being responsible for maintaining a good relationship with the customers. It was highlighted that customer teams often lack the confidence and skills to question the outspoken needs of customers and fail to explore the underlying needs that stimulate innovation. However, the lack of confidence is also apparent among more senior employees that work with exploration and are skilled at identifying underlying customer needs, such as team Xplore.

Team Xplore is the latest addition to the Scout sector, and the team focuses on identifying, conceptualising and verifying new business opportunities. Being a relatively new team, the

members of Xplore state that they have not yet settled in their task. Top management has expressed a desire to increase the amount of radical innovations within the firm and is actively involved in Xplore's innovation efforts to do so. Xplore's projects are commonly assigned by top management, and the team meets with them regularly during the course of a project to receive strategic guidance in their work. Xplore consists of four employees; two who work full-time in the team, and two who divide their time between Xplore and another team in the Scout sector. This has been identified as an issue, since the full team rarely gets time together. With only two full-time employees, the team members state that they are moving forward too slowly in their innovation process. The team's innovation process usually starts with a promising idea that they concretise into a concept and verify with customers. If the concept is deemed promising, Xplore hands over the concept to another R&D or customer team for further development and prototyping.

One reason behind Xplore's uncertainty is believed to stem from the difficulties of evaluating the result of the team's work. Top management state that the final result of the team's efforts is not clearly understood until it has shown to produce value for customers, and even then, it is difficult to prove that the value is a direct result from Xplore's work. Instead, top management state that they evaluate Xplore based on gut feeling and focus more on achieving speed and frequency in their innovation process. The members of Xplore feel unsure about their work process and are under the impression that they are not moving forward fast enough. They are primarily using DT as a method for exploring ideas and gaining insights, and although they find it useful, they also feel that they lack the expertise to confidently know how, and when, to proceed. This has raised the question if the people in Xplore have the necessary competences for exploratory work or if some competence is missing. However, the interviewees find it difficult to pinpoint which competence the group might be lacking.

To conclude, it is important to consider how individuals and teams relate to innovation. It was found that employees at SupplyIT benefit from being empowered, but they also need to gain confidence and support to see their innovation efforts through. Moreover, people at SupplyIT highlight the importance of employees having the correct competences for working with innovation.

4.1.4 Company Culture

One of the most important factors at SupplyIT that has been identified both during the interviews and through observations and casual conversations, is the company culture. SupplyIT has an open and familiar company culture that is highly valued and seen as a competitive advantage. Curiosity, collaboration, accountability, diversity and openness to new thinking is encouraged. Maintaining this intimate 'start-up' culture is seen as challenging considering the firm is growing, but it is a priority. Top management try to promote a permissive culture that accepts failure as source of learning.

People at SupplyIT consider the culture to encourage and support individual's innovation efforts, and employees are perceived to be helpful to each other. However, one interviewee

stated that it is easier to get support for an idea if it has been developed into a concept first. The reasoning behind this is that there is a mentality that ‘everyone has great ideas’, and therefore individuals have to show that they have ‘done their homework’ to get the attention of fellow colleagues. As a consequence, some individuals might be discouraged to drive their ideas, although they could prove valuable to the firm. In response to this, several employees advocate for having what they call ‘brokers’, namely influential individuals within the firm that can promote the development of an idea without judging it. People at SupplyIT want to create a climate where everyone feels confident to bring their ideas forward and take accountability for them. However, there seems to be a lack of urgency among employees to act. One interviewee explained that SupplyIT’s legacy could be a reason behind this. People at SupplyIT has almost only experienced success, since the company has been doing very well, and therefore they do not realise that their lack of action can have severe consequences.

To conclude, people at SupplyIT believe that the firm’s open and permissive culture encourage innovation. However, the mentality that ‘everyone has great ideas’ can discourage people from driving their ideas since it works as a barrier for gaining supporters. Moreover, there seems to be a lack of urgency among employees, which could be explained by people’s experiences of the firm’s successful past.

4.1.5 Top Management Support

An element that truly stood out at SupplyIT was the top management support. All interviewed employees stated that they have an unquestionable support from top management to work with innovation. The members of the top management are respected by the employees and they describe themselves as a support function to the organisation, with the goal of providing the prerequisites for employees to carry out their work. Top management communicate the importance of innovation for the survival of the firm, and actively invest in it. They have been involved in introducing explorative methods that teams at SupplyIT can use. For example, all employees were given the opportunity to participate in a half day course in DT that was held at the head office. Top management has also invested in other innovation initiatives such as CNE, product councils, and team Xplore.

Top management is actively involved in Xplore’s work in the form of a business council that provide the team with assignments and evaluate their findings. However, since Xplore is recently formed, there is a great deal of uncertainty regarding how the team should work and what is expected of them. This has left the team feeling insecure, resulting in the team members looking for reassurance by top management more than they would like to. Although the team appreciate the time invested in them by the top management, they question if the arrangement is optimal for achieving their purpose. If Xplore is mainly getting input from one direction, namely top management, how radical can they be?

To conclude, people at SupplyIT see that having an encouraging and supportive top management that invests in innovation initiatives is crucial to ensure that innovation happens.

However, top management active involvement in driving radical innovation might not be optimal, even though their outspoken support is essential.

4.1.6 Innovation Network

People at SupplyIT state that they have an informal, rather than a formal internal network for innovation. They describe that the easiest way to develop an idea is to talk to the people next to you, who will be able to either help you or guide you to someone who can help. However, as the firm is growing larger, it becomes increasingly difficult to identify the people who might have an interest in a specific idea, especially for new recruits. Moreover, the decentralised organisational structure makes it difficult for people to keep up to date on the ongoing innovation projects, since they are located far apart. The employees want to increase the visibility of the ongoing innovation projects to increase the firm's knowledge sharing, but also to avoid that similar projects are developed in isolation of one another.

The existence of an external network consisting of customers and other actors in the industry was mentioned during the initial interviews at SupplyIT, but never in connection to innovation. When specifically asked about the external network in relation to innovation at the feedback workshop, the employees acknowledged that the network is not currently used for innovation efforts, but that they wish to incorporate it going forward. An explanation that was given for the lack of external collaboration for innovation is that it has to be mediated through account management, a function that is newly instated. However, the employees recognise the benefits of engaging in such a network to be able to develop ideas and products desired by customers, as it leads to a better understanding of the underlying needs. People at SupplyIT believe that greater results are achieved together, and that both internal and external knowledge exchange has a positive effect on innovation. Another issue that was described as hindering a well-functioning knowledge exchange in the external network was the relative importance of SupplyIT's solution to the customer. If SupplyIT's solution has a big impact on the customer's business, they are often more inclined to collaborate, whereas if SupplyIT has a smaller impact, the opposite is true.

Moreover, the people at SupplyIT also identify challenges with trying to utilise their external network for innovation, particularly in relation to their customers. One issue is that the Scout sector that primarily focuses on radical innovation, has no direct customer contact. The teams in the Scout sector are perceived to be located the farthest away from customers, meaning that they have to rely on SupplyIT's internal network to establish customer contact. This is seen to decelerate the innovation process by creating an extra step. One interviewee expressed the need for creating a separate external network for innovation with customers to avoid this dependence. However, some employees are perceived to be very protective of the relationships they have created with their customers, making them reluctant to include others who might jeopardise it. Since not all ideas will ultimately prove viable, SupplyIT would not always be able to deliver on all innovation projects initiated with customers, despite best intentions. People working in customer teams are therefore concerned with eroding the levels of trust they have built by creating expectations that cannot be met. This makes both internal and external communication

essential to manage the expectations of customers. In order to motivate participation, SupplyIT needs to point to the additional benefits of engaging in innovation efforts, such as increased knowledge, even if it does not result in a new solution.

To conclude, people at SupplyIT see benefits in having both an internal and external network for innovation. However, as the firm is growing larger, it becomes increasingly difficult to identify collaborators using the current informal internal network. Furthermore, there are some challenges with utilising the firm's external network. Employees explain that the relative importance of SupplyIT's solution to the customer affects how inclined they are to collaborate on innovation. Moreover, the parts of SupplyIT that focuses on radical innovations have no customer contact and instead have to rely on other teams to engage with customers. In addition, some people working in customer teams are protective of their customer relationship and thereby reluctant to include others.

4.1.7 Innovation Process

Another element that has been identified as crucial to SupplyIT's innovation capability is the innovation process. This element includes the aspects of how the company enables the generation, prioritisation and implementation of ideas. Each of these aspects could be considered elements in themselves. However, during the feedback workshop it was deemed that these three concepts are significantly interrelated, and that reducing them to separate elements could compromise the quality of analysis. Hence, the inclusive term 'innovation process' was chosen to represent all of the above.

Firstly, idea generation does not seem to be an issue at SupplyIT. People in all parts of the organisations have ideas, and they are encouraged to pursue them. However, many customer teams are unsure about how much time they are allowed to devote to innovation work. Since the teams are autonomous, they set their own priorities, which often result in customer requests being the top priority, regardless of their relative importance, and at the expense of innovation work. Team members feel responsibility towards their team to contribute to deliveries, even if they want to devote more time for innovation. Some sectors in the firm have different initiatives to encourage that time is spent on innovation, for example 'Google Friday's' where teams are expected to work on their own ideas every Friday afternoon. People at SupplyIT believe that having earmarked time for innovation work is beneficial, especially in customer teams, although time in itself is not sufficient for making innovation happen.

Even though employees at SupplyIT have many ideas and are encouraged to pursue them, there is nothing in place to ensure that these are captured. Ideas tend to be discussed by the coffee machine or over lunch, but very few proceed from that stage. The ideas generated through CNE are logged in a digital system, but beyond that it is up to individuals to drive their own ideas and find champions for their sake. When asked about the responsibility of individuals to realise innovation efforts, people at SupplyIT saw it as a strength. In their experience, the best innovations are achieved when individuals have the motivation, knowledge and ability to realise

their ideas from start to finish. However, they also acknowledge that this is not always the case, and that individuals have to put much effort into endeavours that might not pay-off.

From the discussion during the feedback workshop, it was discovered that the employees believe that the main issue with making innovation happen at SupplyIT is to keep people engaged and motivated to see their ideas through. It was argued that people do not talk enough about the results of the different innovation initiatives, nor about the ongoing projects. By making everyone aware that individuals' ideas get implemented, they believe that more people will be inspired to pursue their ideas. The interviewees suggested that people at SupplyIT should start sharing their innovation success stories to exemplify the benefits of seeing ideas through. Although the employees agree that implementation of ideas is the most critical phase of the innovation process, they also get the impression that top management believe that the issue lies in idea generation. This reflects top management's support for idea generating initiatives such as Xplore and CNE, but more emphasis needs to be put on ensuring that good ideas get implemented.

Another concern is that individuals and teams hand over their projects. Handovers are particularly common in the Scout sector. Team Xplore is responsible for exploring new ideas, and gather insights, but once a concept has been formed, they hand it over to a team for development and testing. Previously, this team consisted of developers too, but in this constellation, the team focused more on 'building' than exploration. In order to gain an increased focus on exploration the team was rearranged. The people who receive handovers often lack the same level of enthusiasm as the ones who initiated the project, and a great amount of knowledge is lost when handovers occur. The employees therefore expressed a need to minimise the number of handovers**,** and instead introduce an 'engagement phase' to create accountability for everyone included in the innovation process. By shifting from handovers to an engagement phase, people at SupplyIT believe that collaboration will increase and that the innovation process will be smoother and lead to better results. The goal of an engagement phase is to continuously use the knowledge and insights gathered in all stages of the innovation process, and thereby come to better conclusions. During the deep-dive workshop, representatives from team Xplore came to the realisation that handovers are detrimental to the firm's innovation efforts. As a result of this insight, team Xplore started to develop the concept of an engagement phase within the frame of the Vinnova research project. This development took place during the course of this study but had not yet been finalised at its end.

Another identified issue relates to the prioritisation of radical ideas and concepts. It was highlighted during the interviews that ideas and concepts that cannot be tied to a business case, or developed together with a customer, struggle to get prioritised and implemented. This is particularly present when handovers occur. At SupplyIT it is believed that the people that are closest to the problems and customers are the ones most suitable to make decisions regarding prioritisation. The concepts and ideas that Xplore develop therefore have to compete against other, less risky, projects for prioritisation. Teams find it difficult to motivate why they should prioritise projects that do not address current needs of customers or create explicit value.

Internal or organisation-wide projects are therefore rarely a priority and need support if they are to get prioritised.

To conclude, idea generation does not seem to be an issue at SupplyIT, instead the critical part is to get good ideas implemented. However, employees believe that top management believe that the opposite is true, judging by their emphasis on idea generation initiatives. People tend to discuss their ideas by the coffee machine, but few continue from that stage, and there is nothing in place to capture these ideas. Moreover, people in customer teams often neglect innovation work since they do not know how much time they are expected to devote to it, and because they feel responsibility to deliver to their team and customers. Ideas and concepts that cannot be tied to a business case, or developed together with a customer, struggle particularly to get prioritised and implemented. People in the organisation believe that the main issue is to keep people motivated to see their ideas through and propose that people share their innovation success stories to keep people motivated. In addition, people at SupplyIT see handovers as detrimental to the firm since the people who receive handovers often lack the same level of enthusiasm as the ones who initiated the project. Consequently, a great amount of knowledge is lost when handovers occur.

4.1.8 Innovation Support Function

The final element that was highlighted during the study was the existence of an innovation support function. Currently, such a function does not exist at SupplyIT, but it was discussed whether or not team Xplore could take on this role.

The current purpose of team Xplore, as expressed by top management, is “to transform guesses into knowledge”. The newly instated team primarily explores ideas that are considered to be ‘outside the box’. They then deliver insights regarding whether or not these ideas can lead to potential new businesses for SupplyIT. However, there is a great deal of uncertainty within the group on what their role is, and so far, the team members do not consider their results to have been of a radical nature. Thus far, the team’s projects have all been assigned to them by top management, which is seen as a one-dimensional source of input and a potential reason for the lack of radical output.

The team members have also expressed concern about being too far away from customers and the rest of the organisation and want to have a closer collaboration with these. Some people at SupplyIT believe that Xplore is a ‘secret group’ and that the rest of the organisation is purposefully excluded from their work. This goes against SupplyIT’s culture of inclusiveness, and during the feedback workshop, the participants agreed that viewing Xplore as the ‘elite group of innovation’ is detrimental to the firm. People at SupplyIT want to see a closer collaboration between Xplore and the rest of the organisation in order to foster innovation in all the teams. The members of Xplore are skilled at identifying underlying needs of customers, which is something that is lacking in many customer teams. An important topic that has been raised during this study is if the team is actually doing what they should, or if it would be more beneficial to create a different constellation.

An option that was presented is that Xplore could be a support function for innovation, and instead of being the source of ideas, the group could focus on stimulating innovation in the organisation by assisting individuals and teams in the different stages of their innovation processes. The reasoning behind this argument is that innovation implementation is seen to be a major challenge for SupplyIT and needs to be supported. Moreover, the members of team Xplore are influential within the company and have a vast internal network. They have been described by many as 'brokers' and many individuals turn to them if they need help with pursuing their ideas. In addition, the most radical ideas at SupplyIT has thus far originated from employees with fewer, rather than more, years at the company. This suggests that experience of the firm and its current products can be a hinder when aiming at generating radical ideas. As a consequence of this insight, it was decided during the course of this study that Xplore's role should be extended, and that the two full-time members of the group should continue to be involved with the development of one of their concepts instead of handing it over to another team.

To conclude, people at SupplyIT acknowledge that the firm struggles with idea implementation and it is in need of support. At the same time, the team members of Xplore are identified as being very capable of taking on a supportive role, and the team's current configuration has issues. Instead, employees suggested that the individuals in team Xplore could take on the role of an innovation support function in the firm and focus on stimulating innovation in the organisation.

4.1.9 Innovation Capability Insights

The framework of the eight aforementioned elements have been summarised in table 3 together with the highlighted insights related to each element.

Table 3

Insights of each element of innovation capability

Element	**Insights**
Organisational Structure	*The decentralised structure makes communication and knowledge sharing difficult, since teams are far apart.* *The absence of product owners results in lack of accountability among employees.* *Teams are not required to adhere to any specific tools or processes and can therefore choose which tools to use for the current situation.*
Vision and Strategy	*Despite knowing what the vision is, few employees know how to apply the vision and the strategy for innovation in their daily work.* *The firm lacks consensus on what innovation actually means.*
Individuals and Teams	*Nothing in the organisation hinders individuals to pursue their ideas, but support is lacking which puts a great responsibility on individuals.*

	Despite feeling trusted by top management to make decisions, several employees lack confidence and seek out top management's approval before acting. *Customer teams often lack the confidence and skills to question the outspoken needs of customers.* *Members of Xplore are unsure about their work process and under the impression that they are not moving forward fast enough.* *The Xplore team feels that they lack the expertise to confidently know how, and when, to proceed in their innovation process.*
Company Culture	*The company culture supports innovation by being open and permissive.* *It exists a mentality that 'everyone has great ideas', and therefore individuals have to 'do their homework' to get the attention of fellow colleagues.* *The lack of urgency to act might come from the successful history of the firm.*
Top Management Support	*Employees have an unquestionable support from top management to work with innovation.* *Top management communicate the importance of innovation for the survival of the firm, and actively invest in innovation initiatives.* *Top management's active involvement in driving radical innovation might not be optimal, even though their outspoken support is essential.*
Innovation Network	*As the firm is growing larger, it becomes increasingly difficult to identify the people who might have an interest in a specific idea, especially for new recruits.* *The external network is not currently used for innovation efforts.* *Some employees are perceived to be protective of their relationships with customers, making them reluctant to include others.*
Innovation Process	*Even though employees have many ideas and are encouraged to pursue them, there is nothing in place to ensure that these are captured.* *Many customer teams are unsure about how much time they are allowed to devote to innovation work.* *Team members feel responsibility towards their team to contribute to deliveries, even if they want to devote more time for innovation* *The innovation work would benefit from people sharing their innovation success stories to exemplify the benefits of seeing ideas through.* *Top management believes that the issue lies in idea generation, but more emphasis needs to be put on implementation.* *There is a need to minimise the number of handovers to keep the knowledge and insights throughout the process.*
Innovation Support Function	*It would be beneficial to instate a function responsible for stimulating innovation in the organisation.* *The members of Xplore are seen as suitable to form an innovation support function.* *Viewing Xplore as the 'elite group of innovation' is detrimental to the firm.*

4.2 Assessing Innovation Capability

The purpose of identifying the elements of innovation capability was to create a framework that can be used as a basis for an assessment. In turn, this assessment aims to assist in the development of the firm's innovation capability. During the feedback workshop, the participants were asked what they want to assess, how they think it should be assessed, and why they want to assess it.

During the interviews it became clear that the concept of innovation capability was perceived as difficult to grasp. When the interviewees were asked about assessing the firm's innovation capability, many referred to measuring the output of innovation rather than the capability that enables innovation. These employees stated that they want to measure the result and value created by innovation efforts and benchmark it against other firms. In relation to this, suggested formats for the assessment were primarily of a quantitative character consisting of measurable goals and numbers. Those who referred to characteristics of SupplyIT that enable innovation were more interested in qualitative means for assessment. They believe that interviews and discussion that capture the details of the contexts are necessary to gain an understanding of the firm's current situation and the reasons behind it. Furthermore, it was argued that a qualitative assessment contributes to creating engagement among the employees. This shows that people at SupplyIT view innovation from different paradigms, where the latter is more in line with the purpose of this study. It was therefore concluded that a qualitative assessment would be more suitable to enable the building of SupplyIT's innovation capability.

The CEO stated that innovation capability cannot be measured, and that it should not be. The purpose of an assessment in his opinion, is to identify areas of improvements as well as to acknowledge what is working well. Moreover, people at SupplyIT want to be able to assess the innovation capability of the firm in order to understand the development and see if they are heading in the right direction. It is seen as important that any result of the assessment is actionable and visual so that it can be communicated out and easily understood by people in the organisation.

The quantitative innovation capability assessment tool, that was developed and used during the workshop, served three purposes. First to validate the findings, second to facilitate discussion and third to test the suitability of a quantitative assessment. It was found that the quantitative assessment tool had both benefits and drawbacks.

The participating employees expressed that the feedback workshop format was an eye-opener for many of them. First, the participants filled in the quantitative assessment tool by evaluating statements about all elements on Likert scales. This was first perceived by the participants as unclear since they did not see the connection to assessing innovation capability. Another comment was that some questions, such as the ones regarding the innovation support group (what is now called innovation support function), were difficult to answer for people from the

customer teams, since they did not have insights into their work. However, this created discussions regarding why this was the case which was beneficial in other aspects. Discussing the elements of innovation capability in groups of people working in different parts of the organisation enabled knowledge sharing and created consensus on the issues at hand. The participants at the feedback workshop concluded that this type of constellation is needed more since it enables people to understand each other and the challenges and possibilities people are faced with in different parts of the organisation. It was proposed that this type of workshop could be used to assess the innovation capability of the firm, and that the discussion could result in agreement on the actions needed to build it further.

In order to make the result of the assessment tangible, it was argued that it needs to be visualised. As an example, a two-by-two matrix was presented consisting of an axis showing the degree of importance, and the other axis showing the degree of presence of the innovation capability element today, see figure 5 in Appendix C. However, it was found that all elements of innovation capability were considered important, so alternative dimensions on the matrix could prove more actionable.

5 Discussion

The study has developed a framework for assessing SupplyIT's innovation capability by identifying eight elements constituting the concept and examining how these can be assessed to enable the development of innovation capability. In this section, each of the elements will be discussed, followed by a discussion about the framework per se. Lastly, there will be a discussion regarding assessment of innovation capability.

5.1 What Elements Create a Firm's Innovation Capability?

There is no clear agreement among scholars of how the elements of innovation capability should be categorised and as such, any attempt of classification will likely attract debate. However, as argued by Lawson and Samson (2001), this is a necessary step in order to construct a framework and facilitate analysis. Since this study has been conducted at a single firm, the categorisation of this study's elements can be assumed to fit SupplyIT's innovation capability in particular. Although other organisations can use this framework to understand their innovation capability, the classification of the elements has been made to facilitate analysis, and as such it can be reconfigured to better reflect the context of other organisations.

5.1.1 Organisational Structure

The people at SupplyIT see the firm's decentralised organisational structure as beneficial for innovation. This is supported by Cosh et. al. (2012) who state that the optimal organisational structure for innovation is decentralised. Having self-managed teams is a popular approach to empower employees (Moravec et al., 1998) and it has also demonstrated positive effects on innovation (Muthusamy et al., 2005). By keeping units small and autonomous employees feel a sense of ownership and accountability for their results (Tushman and O'Reilly, 1996). However, at SupplyIT the combination of the firm's successful past and the lack of product owners seem to reduce the sense of accountability commonly associated with a decentralised organisational structure. This suggest that the benefits of SupplyIT's structure could be enhanced by addressing the individual reasons behind people's lack of accountability in relation to the firm's legacy and product ownership structure. This is in line with the arguments made by Felin and Foss (2005; 2009) who state that the actions of individuals can be used to explain higher level outcomes.

Furthermore, people at SupplyIT express a concern that the rapid expansion of the firm will affect the current organisational structure negatively, and thus also the firm's innovation capability. Tushman and O'Reilly (1996) highlight that a firm's structure often has to change when it grows in order to handle the increased complexities of the work. This validates SupplyIT's concerns. However, when investigating the optimal organisational structure for innovation, Cosh et. al. (2012) found that both small and large firms benefit from having a decentralised organisational structure. These findings suggest that SupplyIT's current structure is to be preferred for innovation even as it grows larger. However, further investigation is needed to understand how the firm can handle the complexities associated with being a large

firm, without changing its structure. Tushman and O'Reilly (1996) argue that instead of adhering to one structure, firms should host multiple contradictory structures, which could be one possible solution.

5.1.2 Vision and Strategy

The findings suggest that SupplyIT's current vision is too ambiguous, and that the employees prefer to have a clear vision and strategy for innovation that can assist them in decision-making. Several innovation scholars point to the benefits of having a well-articulated vision and strategy for innovation that is known and understood throughout the firm (Lawson and Samson, 2001; O'Connor, 2008; Börjesson and Elmquist, 2011; Björkdahl and Börjesson, 2012). Lawson and Samson (2001) emphasise the need for a common understanding of the vision and strategy for innovation in order to avoid interest and attention becoming too dispersed. This argument supports the view that SupplyIT should seek to achieve consensus on innovation in order to attain a unified direction. Furthermore, Moss-Kanter (2006) argue that an inclusive innovation strategy that includes incremental innovations make people in the organisation more receptive to change in the occurrence of radical innovation. She uses the analogy of an 'innovation pyramid', that bears resemblance to SupplyIT's 70/20/10 model, and propose that firms should have some big bets, several promising midrange ideas, and a broad base of incremental innovation.

Moreover, Lawson and Samson (2001) argue that management should empower employees and seek to incorporate their views in the innovation direction, which is in line with the firm's decentralised decision-making. On the other hand, individuals in self-managed teams are mutually responsible for driving performance in the direction of the firm's vision and strategy (Moravec et al., 1998), which is challenging if these are not clearly understood, as in the case of SupplyIT. The need for a concrete vision and strategy can therefore be assumed to be even more critical in the case of self-managed teams.

The interviewees stress that everyone at SupplyIT have to be better at talking about the vision with their colleagues and discussing how they should interpret it. Knowing that the vision is too ambiguous is what Whittington (2006) refers to as praxis, whereas talking to colleagues about the vision on an everyday basis and translating it into their own context can be seen as practise. According to the PBV, making this connection between the firm-level praxis and the individual-level practise is essential in order to understand innovation capability (Crossan and Apaydin, 2010). The vision and strategy are therefore grounded in the everyday actions of individuals. By talking about the meaning of the vision and how to relate to the strategy in their work, the employees can make it more tangible. Hence, the firm should stimulate these types of conversations in order to achieve the ultimate goal of building its innovation capability.

5.1.3 Individuals and Teams

Lawson and Samson (2001) state that in order to be innovative, firms should hire the best people and then empower them. At SupplyIT, individuals are seen as the drivers of innovation and they

are empowered to act. On the other hand, Birkinshaw et al. (2011) argue that people tend to focus too much on 'the genius' of innovators, and Moss-Kanter (2006) highlight that not even the best innovators can work in isolation. At SupplyIT, there is nothing in place to support individuals in their innovation efforts. Lawson and Samson (2001) state that in order to successfully mobilise resources that are needed in different stages of the innovation process, support from key individuals is required. Moreover, both junior and senior employees experience a lack of confidence in relation to innovation.

A micro-level perspective that can provide insights into this issue is the concept of psychological safety. The concept refers to an environment in which employees feel safe to voice ideas and take risks (Edmondson, 1999). Furthermore, the presence of psychological safety in teams had been demonstrated to stimulate innovation (Newman et al., 2017) and creative performance (Kessel et al., 2012). In turn, team autonomy has been shown to promote psychological safety, but Chandrasekaran and Mishra (2012) found that this is only the case when the task at hand is relatively low in exploration. This means, that team autonomy has a negative effect on the psychological safety of teams when engaged in exploration, which is the case of Xplore. Chandrasekaran and Mishra (2012) further discovered that the psychological safety in autonomous teams increased when there was a clear connection between the team goal and the overall goals of the company. As previously mentioned, SupplyIT's mission is perceived to be too vague to provide guidance for innovation work. Therefore, a clear vision and strategy can further increase the psychological safety at SupplyIT.

The current constellation of team Xplore corresponds to what O'Connor (2008) describes as an identifiable organisational group responsible for major innovations. The goal of achieving radical innovations through the work of Xplore has not yet resulted in any fruitful radical ideas according to the team itself. Moreover, it has been questioned if top management should be as actively involved in their work as they currently are. Radical innovations come from expanding current business views and encountering knowledge sources from outside of the firm through relationships, interactions and alliances (O'Connor, 2008). Innovation scholars claim that top executives are too far away from the action to be able to generate or implement new ideas, and therefore they should hand over the responsibility for innovation (Birkinshaw et al., 2011). This suggest that top management should not be as involved in Xplore's work as they are currently.

However, top management's involvement is only one of several issues that was brought up in relation to the team's challenges. Another was that the team members believe that they lack the required competencies for working with exploration. O'Connor (2008) argues that within radical innovation teams, employees need to be highly multifunctional rather than cross-functional. This means that the individuals are broadly skilled and flexible to adapt to the circumstances required by the exploratory process (O'Connor, 2008). Furthermore, Assink (2006) highlights that curiosity and the ability to overcome pre-judgement are critical competencies for radical innovation. In the initial stages of the innovation process, the personalities of the individuals within the team can be equally as important as the process itself (Assink, 2006). This suggest that the personalities and competencies of the individuals' matter.

Another aspect of the current work of the Xplore team is the evaluation of the group, which today is based on speed and frequency of their process. However, the team expresses that this evaluation only generates stress and a feeling of insufficiency. O'Connor (2008) states that appropriate measures for radical innovation work is new market connections and partnerships, as well as different types of insights and how these insights have contributed to other types of development. Since Xplore solely work with ideas and concepts, not all ideas will prove viable in later stages of the innovation process. However, the team's efforts will result in insights that can be used for other purposes and thus prove valuable. Moreover, Xplore aims to work closely with customers, and as such the measures suggested by O'Connor (2008) can be deemed suitable for evaluating the team's efforts.

5.1.4 Company Culture

Innovation literature suggest that a favourable culture for innovation is characterised by openness, creativity, empowerment, diversity and a tolerance of uncertainty and ambiguity (Assink, 2006; O'Connor, 2008; Lawson and Samson, 2001; Tushman and O'Reilly, 1996). Furthermore, the culture should encourage exploration and risk taking, as well as acknowledge that failures are means of learning (Björkdahl and Börjesson, 2012, Assink, 2006; O'Connor, 2008; Lawson and Samson, 2001; Tushman and O'Reilly, 1996). The portrayal of SupplyIT's culture is notably similar to this description, although it is difficult to distinguish the existent culture from aspirations since the findings are based on the perception of individuals. Either way, the findings points to a preferable culture for innovation at SupplyIT which is positive from an innovation capability perspective.

In addition, large organisations typically require more structure and system to achieve efficiency and control, and therefore struggle to foster an innovative culture (Tushman and O'Reilly, 1996). This justifies SupplyIT's concerns about preserving the culture once they grow. Assink (2006) states that one of the driving factors behind radical innovation is individuals' curiosity, and that large corporations lack the capacity to nurture and motivate such innovators, contrary to small firms. Since SupplyIT focuses and relies on the ability and motivation of its employees, it is particularly important to ensure that the company culture enables innovative individuals to thrive once the firm grows.

In order to manage the challenge for large organisations to foster an innovative culture, Tushman and O'Reilly (1996) propose that firms should be ambidextrous, namely pursue radical and incremental innovation simultaneously. They claim that ambidextrous firms remain small by decentralising decision-making, and by having autonomous teams to instill a sense of ownership and accountability among employees. Further, they propose that the firms emphasise the norms critical for innovation, but that the culture allows for the common values to be expressed in different ways depending on what type of innovation is sought after. SupplyIT's current organisational structure and a common and inclusive understanding of innovation can therefore be seen as enablers to preserve the company culture during the expansion. Tushman and O'Reilly (1996) further verify this reasoning by stating that the culture has to be reinforced

by a common vision and a strong leadership, suggesting that the whole system needs to be taken into account.

One of the issues relating to SupplyIT's culture is that ideas have to be 'packaged' in a certain way in order to attract the supporters needed to develop the idea further. People at SupplyIT propose the notion of brokers to counteract this negative effect. Innovation broker is a term often used in theory based on the network approach on innovation and refers to "an organisation acting as a member of a network of actors in an industrial sector that is focused neither on the generation nor the implementation of innovations, but on enabling other organisations to innovate" (Winch and Courtney, 2007:751). This definition thus refers to a mediator on a macro-level. However, Winch and Courtney (2007) also argue that the role of an innovation broker is to be an independent mediator that facilitate the innovation process, which could be applied on a micro-level. In their study, Winch and Courtney (2007) point to the importance of the broker's positioning within the network and its ability to reduce risk for the adopters by providing authoritative approval. In a firm setting, an innovation broker can thus be seen as an individual with a vast internal network, whose involvement legitimise ideas in the minds of potential supporters. If firms should have innovation brokers, further investigation is needed to determine how such individuals are identified, and whether or not they should have a formal or informal role within the organisation. According to Felin and Foss (2005), understanding these micro foundations is essential to be able to explain the higher-level concept.

The need for individual level analysis becomes even more apparent when examining the relation between innovation efforts, employees lack of urgency and SupplyIT's successful legacy. Top management is pushing for more radical innovations, but at the same time there seems to be a lack of urgency among employees to act on this, despite a strong will to be more innovative. SupplyIT's legacy and the fact that people only have experienced success is offered as an explanation for this occurrence. From a PBV perspective (Whittington, 2006; Crossan and Apaydin, 2010), the desire to increase the amount of radical innovations can be seen as an espoused theory that guide the actions of practitioners, and the lack of urgency is the result of the actions that they have actually taken. Moreover, the firm's legacy of success can be seen to influence the feedback loop relating to this. Somehow, the lack of radical innovation loses its severity in the minds of people due to their experience of success, which ultimately changes their actual practices. In order to build innovation capability, SupplyIT must therefore first understand how to reduce the gap between intention and theory-in-use.

5.1.5 Top Management Support

Top management support has been highlighted in this study as being one of the elements of innovation capability. Innovation scholars, such as Börjesson and Elmquist (2011), Assink (2006) and Lawson and Samson (2001) mention top management support as an important influence, but do not consider it to be a distinct element. At SupplyIT, top management support is of high importance to innovation, and it was highlighted frequently during the interviews. Due to this strong emphasis, it was deemed relevant to include top management support as an element in the framework of this study.

Judging by the depiction of top management's relation to innovation in literature (Assink, 2006; Tushman and O'Reilly, 1996; Börjesson and Elmquist, 2011), SupplyIT's top management support for innovation seem exemplary. Employees agree that top management show their support in an active way in the organisation and have an open-minded attitude to change. In turn, this makes people feel that they can influence areas of interest within the firm. This is an unusual case, since theory usually highlights the difficulties with obtaining sufficient support for innovation from top management (Assink, 2006). An active support is, according to Börjesson and Elmquist (2011), important, not only for innovation, but also for the development of capabilities within the organisation. Björkdahl and Börjesson (2012) also highlight the importance of top management support in terms of investment in innovation. At SupplyIT, top management has invested in innovation by creating initiatives such as CNE, Xplore and business councils. Additionally, they have provided courses in DT methodology for all employees, albeit somewhat rudimentary, which is seen as a methodology to generate innovative solutions to complex problems (Carlgren, 2013).

Moreover, top management support needs to be in accordance with the organisational strategy and vision, and be grounded in actionable initiatives, to enable the members of the organisation to use the support in a successful way, and act accordingly (Björkdahl och Börjesson, 2012). In terms of innovation work, Börjesson and Elmquist (2011) state that the role of top management is to provide a clear, strategic direction. Although this might be true for a large corporation, it can be assumed that in smaller firms, top management can be more involved in the firm's innovation efforts, which they have in SupplyIT's case.

However, in the case of Xplore, the degree of support and involvement of top management has been questioned. Top management has expressed a desire to develop radical innovation through the work of Xplore. The team members state that they have the mandate and support by top management, but their active involvement seems to become a limiting factor for Xplore and the confidence they have in their abilities. According to Assink (2006), a controlling instead of trusting senior management is a barrier towards radical innovation. In this case, top management is perceived to be trusting, but their active involvement in Xplore's work, combined with the lack of confidence of the Xplore team members, seem to constitute a hinder for innovation. In addition, this degree of management involvement goes against the autonomous culture of SupplyIT.

SupplyIT's top management also provide assignments and give feedback to Xplore regularly. This is being done to show the support to the group, since the group is newly started. But Birkinshaw et al. (2011) highlight the importance of shared responsibility for innovation, and state that it is unsuitable to have top management responsible for providing new ideas since they are often too far from the daily work. In line with the previous argument made by Börjesson and Elmquist (2011), SupplyIT's top management should instead focus on ensuring that the vision, mission and strategy for innovation is clearer and more actionable. Moreover, Chandrasekaran and Mishra (2012) found that team autonomy combined with exploration have a negative impact on psychological safety, whereas a clear alignment between the team's goal

and the overall vision has a positive impact. This suggest that top management could be of more use for Xplore by focus on providing a clear vision and strategy for innovation that they can relate to. To ensure that Xplore finds guidance in the corporate strategy, the present-day levels of communication between the team and top management should remain. This is to ensure that there are no barriers for communication, which is of high importance for innovation work according to Assink (2006). In addition, insights of market and technological opportunities from Xplore should be communicated to top management, which is also present today.

In regards to top management support for innovation, O'Connor (2008) argues that organisations cannot rely on the supportive characteristics of certain members of top management. Instead, she proposes that firms must have a management system in place for supporting innovation. The basic assumption behind this reasoning is that in the face of change, a management system for innovation is more robust compared to innovation advocates in top management. The economic success of SupplyIT has gone from good to great, but at one point in the future, the firm will most likely face adversities. Therefore, a crucial aspect to discuss is what will happen at such occasion, and especially when the company is growing rapidly. Innovation initiatives, such as team Xplore, that cannot explicitly carry their own cost, and therefore, such initiatives might not be prioritised in times of economic turmoil since it can be seen as superfluous by top management. Indeed, this is often the case when firms grow larger (Tushman and O'Reilly,1996). Hence, SupplyIT should try to establish support for innovation that reaches beyond the opinions of top management. This could be in line with O'Connor's (2008) proposal of a management system, or in the form of a dedicated innovation support function, which will be discussed further in the section about an innovation support function.

5.1.6 Innovation Network

The need for an external network was only mentioned briefly during the interviews but received a great deal of attention in the feedback workshop. An explanation for this difference could be that the questions asked during the interviews were formulated in such a way that this topic was unintentionally excluded. Another reason could be that since people at SupplyIT do not use their external network for innovation today, it did not come to mind until specifically asked about it. However, it was stressed as being of the uttermost importance for the company during the feedback workshop. This is further strengthened by the importance that has been given to the element in previous literature (Lawson and Samson, 2001; O'Connor, 2008; Björkdahl and Börjesson, 2012). The theoretical frameworks, however, are based on studies of large firms, which could indicate that having an external network for innovation is more important for large firms.

According to Björkdahl and Börjesson (2012) and O'Connor (2008), building linkages with external parties leads to new stimuli that increase the capability to work with innovation. These external parties can be customers, suppliers, competitors and other non-market participants and function as a source of innovation (Lawson and Samson, 2001). Since SupplyIT has been growing rapidly, it can be assumed that the firm has received new stimuli in the form of new recruits. Hence, there might not have been a considerable need for the firm to seek stimuli in

an external network. However, this might become more important for SupplyIT in the future, since the difference in size affects how the firm relates to innovation (Tushman and O'Reilly,1996). Moreover, in their study of the innovation capability of small high-tech firms, Börjesson and Löfsten (2012) found that the two most important dimensions in their framework relate to external network connections. They state that small firms benefit from the exchange with an external network mainly for knowledge generation. This suggest that an external network is of great importance for innovation, regardless of firm size.

Currently, there are networks in place at SupplyIT, both internally and externally. However, they are not used for innovation work to the desired extent. At the feedback workshop it was stressed that the external network needs to be developed further in regards to innovation work and include more cooperation with both customers and experts from academia. Björkdahl and Börjesson (2012) argue that adding supplementary resources, experiences and knowledge lead to collective learning and advancement. This is further supported by Lawson and Samson (2001) who highlight the importance of going beyond the traditional boundaries of a firm to discover relevance in the market and how to approach it collectively. Further, they state the importance of utilising the benefits from being part of a network in order to develop innovation. These arguments are closely related to those promoting the network approach on innovation, where the locus of innovation is seen to reside within the network, rather than within a single firm (Saxenian, 1994; Powell et al., 1996; Chesbrough et al., 2006; Björk and Magnusson, 2009). However, innovation networks are often studied on a macro-level (Crossan and Apaydin, 2010), suggesting that a multi-level analysis of this element could be beneficial. Furthermore, the benefits achieved from participating in an external network depend on the success of which both formal and informal personal relationships are created (Lawson and Samson, 2001; O'Connor, 2008). This suggests that the individual-level of analysis needs to be considered as well. Moss-Kanter (2006) strengthens this argument by highlighting that firms commonly undervalue the human aspects of innovation, in particular neglecting the importance of external communication and relationships.

In terms of the internal network, people at SupplyIT argue that communication and coordination is difficult due to the decentralised organisational structure. This argument is strengthened by existing literature (Cosh et. al., 2012), and Tushman and O'Reilly (1996) propose that the solution is to strengthen social influences. For example, psychological safety has been shown to improve communication and increase knowledge sharing on an individual and team level (Newman et al., 2017). The basis for psychological safety, namely that people need to feel safe to voice their ideas, take risks, collaborate and exchange honest feedback (Edmondson, 1999), can be assumed to be a prerequisite for a successful network, as it has been shown to be for other social constructs (Newman et al., 2017). Moreover, a creative climate is to be preferred in the network in order to stimulate innovation (Isaksen et al., 2001; Björkdahl and Börjesson, 2011). For SupplyIT to achieve the maximal benefits from an innovation network, the focus should therefore be to ensure that these micro foundations stimulating collaboration and knowledge exchange, are present in the network, both internally and externally. For example, an issue that needs to be addressed is how the interpersonal customer relationships are managed. The findings suggest that people working close to customers are hesitant to trust the Scout

teams looking to collaborate with customers in relation to innovation. Trust is a prerequisite for both psychological safety and creative climate (Edmondson, 1999; Ekvall, 1996), hence, the underlying reasons behind the lack of trust at SupplyIT should be investigated further.

5.1.7 Innovation Process

The following discussion concerns the generation, prioritisation and implementation of ideas at SupplyIT, as they are all essential parts of the innovation process. There are ideas present at the company and initiatives supporting idea generation, such as Xplore and CNE, but the implementation is not as prioritised within the company. Birkinshaw et al. (2011) state that this is a common occurrence. Top management put effort and resources into idea generation, but previous literature highlights that problems and limitations are usually further down the innovation process, during the implementation (Birkinshaw et al., 2011; Assink, 2006). This is in line with the findings at SupplyIT, showing that employees believe that implementation of promising ideas is the most critical aspect for making innovation happen.

Making innovation happen is particularly challenging in firms where innovation is the responsibility of the entire organisation (Birkinshaw et al., 2011). To have devoted time for idea generation and 'blue sky' thinking within the role description is an initiative for innovation work and a way to be creative within the firm (Lawson and Samson, 2001). This is done at SupplyIT today by the work of both Xplore and CNE and is also encouraged throughout the organisation. However, people in customer teams are often torn between their desire to innovate and their responsibility to contribute to their team. Birkinshaw et al. (2011) highlight that employees often face issues related to capacity, time and motivation resulting in a lack of follow-through in innovation work. If the need to innovate was truly institutionalised within the firm, it can be assumed that the teams would understand why they need to devote time to innovation efforts and act accordingly.

At SupplyIT, the motivational factor of innovators was highlighted as the primary concern. People are typically motivated more by intrinsic factors such as recognition or pride, and even if their own ideas are rejected, seeing the successful implementation of their colleagues' ideas has a positive impact (Birkinshaw et al., 2011). This supports the suggestion that SupplyIT should share their innovation success stories to motivate people in seeing their ideas through. However, it can be questioned if it is enough to ensure that individuals are highly motivated, or if there is a need for more structured approach. According to Birkinshaw et al. (2011) it is a common perception that innovation solely rely on the inspiration and abilities of insightful innovators, but it seems that the most important ability for innovators is grit. However, even the best innovators cannot work in isolation (Moss-Kanter, 2006). If innovation concepts are to grow, the innovators have to gain supporters that advocate for their ideas (Moss-Kanter, 2006). Lawson and Samson (2001) also highlight that individual rewards often result in increased idea generation, whereas group rewards tend to increase the implementation of ideas. Hence, SupplyIT should focus less on individuals in the implementation stages of the innovation process in order to increase the likelihood of success.

Another issue that was mentioned in relation to the innovation process, is that it is difficult to prioritise ideas that are abstract, general or not directly tied to a business case. Björkdahl and Börjesson (2012) state that firms have to make conscious decisions to work with innovative offers and change the basis for decisions. This is further supported by Moss-Kanter (2006) who argues that innovation projects need to be exempted from certain process requirements due to their difference in character. She proposes that the firm instead adopt a flexible and customised evaluation of these type of projects. This assumes that people can identify the ideas that are abstract, general or not directly tied to a business case, and customise the evaluation procedure accordingly. In SupplyIT's case, this can be challenging, since all teams are responsible for setting their own priorities. However, with a good understanding of why these types of innovations need to be prioritised it can be assumed that people would feel more comfortable in making those decisions.

5.1.8 Innovation Support Function

As previously mentioned, a decentralised organisational structure is optimal for innovation, but it also poses challenges around communication and coordination (Cosh et. al., 2012). It can be argued that SupplyIT relies too heavily on the abilities of individuals to drive innovation, and that additional support is needed. One solution that has been proposed by employees is to have brokers that can help innovators gain supporters for their ideas, which is essential to turn ideas into innovations according to Moss-Kanter (2006). Moreover, O'Connor (2008) argues that a management system for innovation is preferred over the support of individuals since it is more robust. By relieving the original founder of the full responsibility for execution, and instead introducing an orchestrator in the form of an innovation support function, the firm can ensure that the innovation capability is not lost (O'Connor et al., 2008).

During the interviews, it was suggested that the team members of Xplore would be suitable to take on the role of an innovation support function. People at SupplyIT highlight that the current structure and responsibility of team Xplore, poses a risk that people in the firm perceive the team as an elite innovation group, which is incompatible with the inclusive nature of SupplyIT's culture. Moss-Kanter (2006) highlights the negative effects of this type of constellation, and state that people in the rest of the organisation will crush the innovations supplied by an innovation group since they are perceived to get the benefits of working with exciting projects, while the rest of the organisation bring in money. Instead, she highlights that innovations need connectors: people who know how to find partners that can sponsor embryonic innovations and help them move into the next stages of development. This role is what people at SupplyIT refers to as brokers, which the people in Xplore has been identified as.

This suggests that the organisation would benefit from having team Xplore as an innovation support function. Both the members of Xplore, and other employees want a closer collaboration between the group and the rest of the organisation, and neither want it to be perceived as a secret group. Börjesson and Elmquist (2011) also highlight the need for a function that supports the development of innovations at the firm and argue that it should be part of the organisation

rather than a separate exploratory group. Moreover, people in the organisation view the members of Xplore as experienced and skilled in exploration, which is lacking in many customer teams. These individuals can therefore be assumed to possess the characteristics of capable innovation coaches. O'Connor (2008) highlights that coaching is necessary to build cumulative experience and wisdom, since knowledge cannot be proceduralised in environments that are defined by uncertainty. Hence, coaching is particularly important to develop more radical innovations (O'Connor, 2008).

5.1.9 A Systems Perspective on Innovation Capability

This study has adopted the systems perspective on innovation in accordance with O'Connor (2008), even though this study has a broader definition of innovation than O'Connor (2008). The elements of innovation capability are seen to affect each other to such an extent that a change in characteristics of one element, will affect another. How the elements of innovation capability are interrelated can be exemplified through the elements of 'top management support' and 'company culture'. SupplyIT's company culture is valued by top management, and sustaining the culture is, and has been, of highest importance throughout the firm's growth. The people at SupplyIT also value the company culture and describe it as open and supportive. If top management changes its leadership approach, the company culture would most likely change as a consequence. It would be difficult to sustain the current company culture with a controlling and risk-averse top management. In turn, this would lead to diminishing idea generation at the firm due to a reduced creative climate, where people are hesitant to bring up their ideas in the organisation, as they do now. Moreover, initiatives such as CNE and Xplore might not be prioritised, and ideas and concept would have to be developed under the radar. On the other hand, a lack of successful innovation projects can in turn affect top management's willingness to act, either by increasing or reducing the prioritisation of innovation work. These examples highlight the importance of adopting a systems perspective on innovation capability to increase the awareness of the interrelatedness of the elements. Above all, the interrelatedness of elements show that they cannot be measured in isolation, but that they instead need to be considered as a part of a system (O'Connor, 2008).

5.2 How Can These Elements be Assessed to Enable the Development of a Firm's Innovation Capability?

The second research question relates to how innovation capability can be assessed and monitored to enable its development. The following section aims to discuss the implications of different assessment approaches. Furthermore, suggestions are presented on how to visualise qualitative results in order to make them actionable.

5.2.1 Benefits and Drawbacks of Quantitative and Qualitative Assessment Approaches

When asked about assessing SupplyIT's innovation capability many confused the term innovation capability with innovation outcome, which is not surprising considering the field of innovation research is considered complex and fragmented (Crossan and Apaydin, 2010; Martin, 2012). Moreover, it can be assumed that measuring in numbers is more tangible, actionable and easier to understand. Many employees expressed a desire to measure the value of their innovation efforts and benchmarking against other firms, which is in line with the desires of many innovation scholars and other practitioners alike. As it stands, scholars have not been able to understand how the determinants of innovation capability deliver innovation outcomes and result in firm performance (Crossan and Apaydin, 2010). However, management scholars believe that the most promising area of research concerns firms' innovation capability (Lawson and Samson, 2001; Björkdahl and Börjesson, 2012; Cooper and Kleinschmidt, 2000; Calantone et al., 2002; Börjesson and Elmquist, 2011).

Some issues with the current assessment tools for innovation capability are that their focus is too narrow (Björkdahl and Börjesson, 2012), their construct validity is inadequate (Björkdahl and Börjesson, 2011), and are built on quantitative measures, when the construct of innovation capability is arguably too complex for achieving sufficient quality of such measurements (Cording et al., 2010; Goldman, 1990). The latter argument is further supported by the systems perspective on innovation capability (O'Connor, 2008), and that the findings imply that elements of innovation capability are interdependent. Goldman (1990) argues that qualitative assessments are better at providing a holistic understanding. Several employees also advocate this approach for assessing innovation capability.

In terms of the purpose of the assessment, SupplyIT's objective is to identify the firm's strengths and areas of improvements to be able to point people in a desired direction for their innovation efforts. This is in line with the arguments made by Björkdahl and Börjesson (2012), who claim that the purpose of assessing innovation capability is to assist firms in building their innovation capability. For this purpose, Goldman (1990) argues that a qualitative assessment is preferred since it allows for active involvement of participants in collecting and analysing data, which stimulate their understanding. The people at SupplyIT also consider increased employee involvement and engagement as a benefit of this approach. However, the abductive character of qualitative assessments (Patton, 2002), restricts possibilities for benchmarking SupplyIT's results against other firms or best practise. Instead it involves generation of situation specific knowledge, which is difficult to compare with external sources (Easterby-Smith et al., 2015). As argued by Priem and Butler (2001), the theoretical grounds of the capability perspective assume that the product market is homogenous, and as such, firms should focus their efforts inwards instead of outwards. Hence, from an innovation capability perspective, the primary focus of an assessment should not be to benchmark against external sources, but instead improve internal practises and competences.

5.2.2 Qualitative Assessment Formats

In terms of the format of a qualitative assessment, people at SupplyIT advocate for interviews and workshops that facilitate discussion between individuals working in different parts of the firm. These are commonly used means for qualitative assessments, and they can be conducted in a variety of ways (Easterby-Smith, 2015). The structure of the feedback workshop, that was conducted as a part of the study, was suggested as a good example by the employees. However, if the firm seeks a purely qualitative assessment, some adjustments and refinements have to be made to this format. The main objections to using a direct replication of the feedback workshop's structure can be divided into three parts. First, the main purpose of the feedback workshop was not to conduct a qualitative assessment, but to validate the different elements of the developed framework. As such, the feedback workshop was structured to achieve this objective. One of the requirements to achieve quality in qualitative assessments is to have coherence (Tracy, 2010). It would therefore not be advisable to emulate the structure of a workshop that is designed to fulfil a different purpose without evaluating other options.

Second, a quantitative assessment tool in the form of a questionnaire was developed and used during the feedback workshop that displayed several shortcomings. Although, the assessment tool facilitated a fruitful discussion, the tool in itself was found deficient. For example, several explanations were needed for the participants to comprehend the statements. However, despite clarification of the statements, it became obvious that people interpreted them very differently. This could be an effect of a poorly constructed questionnaire, which indeed influenced the level of confusion. Be that as it may, Goldman (1990) argues that these types of quantitative assessments are built on the unfounded assumption that all test subjects fully understand the statements provided, regardless of the quality of their formulations. However, it can be argued that if a quantitative assessment tool is used purely as a basis for discussion, it could be useful. Especially, if parts of the assessment tool include quantitative measurements that have been academically validated, such as Ekvall's (1996) CCQ or Edmondson's (1999) 7-item scale. However, alternative tools for facilitating discussion should also be evaluated. Journey mapping is a qualitative tool that was used favourably in this study according to the authors. This tool enables a deeper understanding of individuals in their everyday environment (Liedtka, 2015), and can therefore be useful in facilitating discussion. Thus, further investigations are needed into the proven benefits of using journey maps and other similar qualitative tools.

This brings about the third and final objection to emulating the aforementioned structure of the feedback workshop, which relates to the brief consideration of visualisation options. During the feedback workshop, a two-by-two matrix was presented as an alternative for visualising the results of a qualitative assessment. People at SupplyIT stress that any results should be actionable and visual to make it tangible and easily monitored. This argumentation is supported by Liedtka (2015), but she also highlights that there are many different visualisation options to choose from. These include traditional tools such as charts and graphs, but also storytelling and metaphors (Liedtka, 2015). Lakoff and Johnson (1985) claim that the use of metaphors aid people in making sense of previous experiences and guide them towards new ones. Moreover, Liedtka (2015) states that storytelling helps decision-makers to absorb rich details about

people's lives. Since the ultimate objective of the assessment is to help SupplyIT build its innovation capability, different types of visualisation formats should be evaluated to ensure that people in the organisation understand the outcome and can act on it.

The result of qualitative assessments is often vague (Goldman, 1990), and research shows that it might be difficult to get top management support under circumstances involving high levels of ambiguity (Assink, 2006). SupplyIT's CEO on the other hand, seem to embrace ambiguity and support a qualitative assessment approach of innovation capability. Having this support from top management will presumably increase the likelihood that any actions plans generated from a qualitative assessment are executed.

5.2.3 Practical Considerations for the Assessment of Innovation Capability

Although, further investigation is needed in regards to specific tools and choice of assessment format, the previous discussion highlights that a qualitative assessment is preferred and that it should be constructed based on SupplyIT's objective in order to assist in building the firm's innovation capability. However, there are also more practical concerns that need to be considered before commencing an assessment. In particular, decisions must be made on where the responsibility for conducting the assessment should lie and which people should be invited for interviews and workshops. During the feedback workshop, people from different functions and levels were invited to partake which was greatly appreciated by the participants. When investigating several firms using DT, Carlgren et al. (2016) found that many of them see that there is a strength in having diversity both in terms of skills and personalities. This suggest that achieving some level of diversity should be aspired when selecting the subjects for the assessment activities.

Furthermore, O'Connor et al. (2008) argue that someone needs to be responsible for ensuring that innovation activities are carried out. They propose the role of a management system to take on this responsibility. However, in line with the arguments made previously in relation to an innovation support function, the authors propose that the assessment could be the responsibility of that function. The qualitative nature of the assessment requires people who are skilled at exploration, which the individuals in Xplore are known to be. The purpose of the assessment and its outcome is to support the entire organisation in building innovation capability, something that is much related to the purpose of an innovation support function.

6 Conclusion

The purpose of this thesis was to assess SupplyIT's innovation capability by identifying elements, and proposing actions on how these can be monitored, to enable the development of the firm's innovation capability. The study has been conducted through interviews with employees with different roles and in different teams at SupplyIT. Furthermore, the study included observations, both during formal meetings and a workshop, as well as during informal conversations at the SupplyIT's head office.

Eight elements of innovation capability were identified, namely 1) *organisational structure*, 2) *vision and strategy*, 3) *individuals and teams*, 4) *company culture*, 5) *top management support*, 6) *innovation network*, 7) *innovation process* and 8) *innovation support function*. Previous theory supports the existence of these eight elements, although they are clustered differently. Moreover, it is proposed that a systems perspective is necessary for assessing innovation capability, since the elements were found to be interrelated. This means that changes in one of the elements will affect others. It is therefore necessary to consider the whole system when attempting to influence the firm's innovation capability. In addition, it was found that the micro foundations that underpins the concept of innovation capability should be highlighted in order to ground the theory in the actions of people and gain a better understanding of the influencing factors.

In terms of innovation capability assessment, previous literature suggest that the field of research is too complex and fragmented to rigorously conduct a comprehensive quantitative assessment. Instead, qualitative means of assessment is preferred since they are more focused on generating knowledge. A proposed tool for conducting a qualitative assessment is through discussions within a diverse group of people from different parts of the firm. Depending on the aim and goal of the assessment, different topics can be discussed. Through the use of qualitative assessment like discussions, the micro level actors, practices and mechanisms can be identified, and action plans can be created in order to fulfil what is needed at a higher level. In turn, this can be used for building the firm's innovation capability. The study therefore makes several contributions. The findings provide insights for practitioners looking to build their firm's innovation capability, but also to academia in terms of the proposed framework for innovation capability and the insights into how this could be assessed. Moreover, the study also contributes to the affiliated Vinnova research project, and to the firms involved, by engaging in knowledge sharing and investigating the innovation capability at SupplyIT in-depth.

Future research should investigate this topic further, proposedly through a longitudinal study in which the development and impact of innovation capability assessments can be evaluated. Furthermore, researchers, and practitioners alike, would benefit from having a common nomenclature of the elements of innovation capability, as well as a better understanding of the relative importance and interrelations of these elements. For example, are there particular elements that are more crucial for radical innovations compared to incremental ones, or does the existence of some elements trump others?

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Appendices

Appendix A: Interview Template for team Xplore

1. Intro

- Present ourselves and the purpose of the study. Recording – OK?

2. Interview

Introduction

- Please, tell us about yourself and your role at SupplyIT?
- What is the purpose with the Xplore team?
- How does your job in Xplore relate to the company's vision and goal?

DT

- Please, tell us about how your working process is with examples from a recent project?
- In what way do the team Xplore use DT?
- In what way do other people in the organisation use DT, and by whom?
- How are the teams put together?

Team Xplore

- How does the way of working differ in Xplore from other R&D/project teams?
- How does the goals differ from team Xplore from other R&D/project teams?
- How do you assess your processes?
- What determines what projects that Xplore gets?
- What competences are important to have in a team as Xplore? Why?
    - What competences exists in the team now?
    - Is there any competence missing according to you?
    - How do you develop your competence?
    - Is anything missing for you in your work of developing your competence?
- Do you have all resources (competence, time etc.) needed in the team as it is now? Why/Why not?
- Do you believe that SupplyIT as a whole has resources (competence, time etc.) to realise your work? Why/Why not?
- What in the organisation supports your work with innovation?
- What in the organisation hinders your work with innovation?

Innovation and Innovation Capability

- What is your perception on innovation?
    - Are you familiar with the notion of incremental and radical innovation?
    - Can you give an example on how the way of working differs to achieve incremental and radical innovation?
    - What way of working is most similar to the way you work in Xplore?
- What is your perception on innovation capability?
- Can you give an example on what fosters innovation at SupplyIT?
- Can you give an example on what hinders innovation at SupplyIT?

- How are new ideas being handled?
- What do you think is interesting with assessing the innovation capability?
    - What do you want to achieve with assessing the innovation capability?
    - What aspects that can be connected to innovation do you believe is important to assess?
- Why is the innovation capability not assessed as it is today?
- What format of an assessment would give you most value? Why?

3. Outro

- Any suggestions on who we should interview next?

Thank you.

Appendix B: Analysis of SupplyIT Innovation Capability in comparison to theory

Björkdahl and Börjesson (2012)	O'Connor (2008)	Assink (2006) (barriers)	Lawson and Samson (2001)	SupplyIT
				Vision
Strategy for innovation (well-articulated & understood throughout the firm)	MI systems objectives connected to strategic intent		Vision and strategy (link between vision strategy and innovation)	A clear vision that relates to innovation and can help guide individuals' innovation efforts, regardless of where they are situated in the organisation
			Stretch goals for innovation	
				Culture
Organizational context & learning (knowledge generation and diffusion in the org., eg. insights from previous efforts, whom to contact/collaborate with, skilled staff)	Mechanism for constant reflection and reconfiguration	Inability to unlearn	Communication	An open and permissive culture that encourages new thinking and learning from failures
Culture (attitude to experimentation, exploration, ok to fail, generating knowledge, etc)	Recognising the importance of MI in the org. (culture and leadership context)	Obsolete mental models of how the world works	Empowered employees	A shared understanding of what "innovation" is.
		Unwilling to cannibalise	Tolerance of ambiguity	Confidence and a sense that anyone can contribute to making innovation happen
		Path dependency and previous success		
		Reinforcing the status quo		
				Top Management support
			Reward systems	Top management talk about the importance of innovation and actively support it by investing in innovation initiatives.
				External Network
External environment & linkages (building networks, alliances & relationships with external actors)			Learning about customers	There is a network of external actors that is utilised for innovation efforts
			Learning about competitors	
				Idea Realisation
Idea Management (systems, structures and routines in place to support idea generation search)		Inability to unlearn	Creativity and idea management	Individuals in the organisation have earmarked time for innovation efforts
		Use of old competencies		Individuals in the organisation feel accountable for realising their ideas and are part of the entire innovation process

		Lack of market sensing and foresight		Engagement, knowledge and relationships are retained by minimising handovers.
		Lack of creativity		Innovation success stories are shared in the firm and show that innovation work pay off.
Systems & decision rules (rules/principles to support strategy & operations by ear-marked funds etc)	Product evaluation based on real-option	Lack of realistic revenue & ROI expectations	Resource management	The value of an idea can be evaluated, even if it is not connected to a business case
Prioritisation (the importance given to innovation)	MI system loosely coupled with mainstream (resources, network, and BU systems)	Lack of infrastructure to integrate radical innovations	Expect creative time (given to innovation)	Individuals that lack knowledge or ability to realise their ideas can turn to someone for support
	Mechanism for governing MI Venture portfolio	Risk averse climate (inability to develop/implement receive innovative ideas)		
Implementation (ability to develop a new idea into a concept or new offer)		Lack of follow-through		
		Lack of infrastructure to integrate radical innovations		
				Innovation Support Group
	Mechanism for constant reflection and reconfiguration	Innovation process mismanagement (team flow)	Innovation champions	The group is responsible for stimulating innovation within the organisation
	MI systems role communicated out to the org.	Inability to unlearn		The group is a support function for individuals that need help in realising their ideas, for example by helping to create engagement or attracting supporters
	Metrics for high-risk, high-uncertainty objectives	Use of old competencies		The group is responsible for arranging innovation capability assessment workshops and follow-ups.
	MI systems project management process decoupled from mainstream			
	Requisite skills & talent development			
	Learning-oriented, exploratory processes for project progress			
	Identifiable group			

Appendix C: Figures of the analysis steps

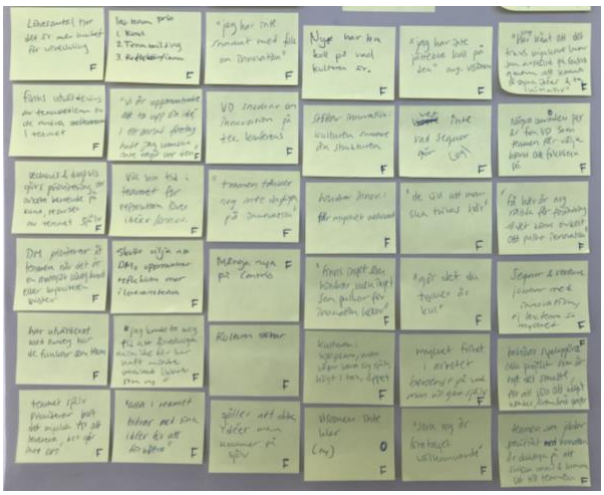

Figure 3. Example of a persona board.

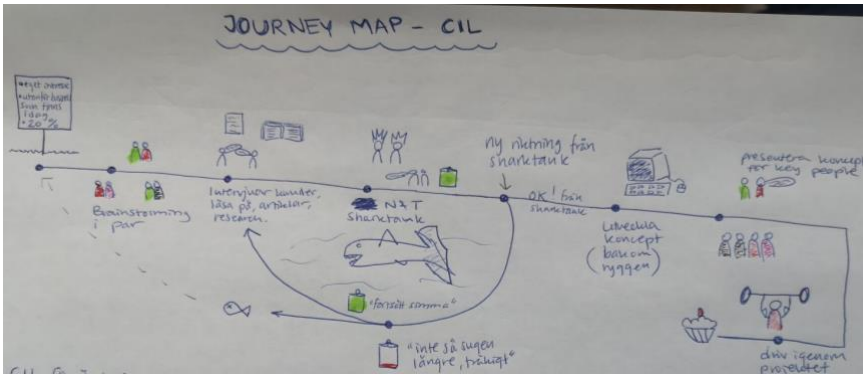

Figure 4. Overview of a journey map analysis.

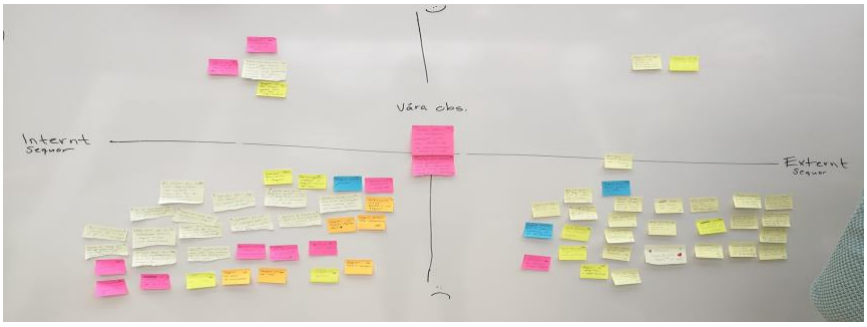

Figure 5. Overview of a two-by-two matrix analysis.

Figure 6. Clustering analysis of sticky notes into themes.