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The Innovation Potential of Established SMEs

An analysis of three established SMEs in niche technological industries and the identification of viable organizational factors for improving their innovation capabilities

Master's thesis in Management and Economics of Innovation

MONA KILSGÅRD
ALEXANDER ÖRNBRATT

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
DIVISION OF ENTREPRENEURSHIP AND STRATEGY

CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2022
www.chalmers.se
Report No. E2022:058

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Department of Technology Management and Economics
Chalmers University of Technology
SE-412 96 Gothenburg
Telephone +46 (0) 31-772 1000

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Abstract

There is a shortage of literature focusing on evaluating the innovation capabilities of long-established, small and medium-sized enterprises (SMEs) in niche technological industries. The purpose of this thesis was to provide an in-depth, comprehensive perspective on the organizational issues affecting innovation capability at this type of firm, and feasible improvements to these issues. To investigate this, fifteen employees across three small subsidiaries in a niche-technology corporate group were interviewed for their perspectives on their company's characteristics and processes. The findings suggest that such companies experience issues affecting their level of innovation capability on multiple dimensions: resources, processes, culture, and direction. These companies must implement structured systems for process and idea management, and increase collaboration with external actors. They must ensure clear communication across departments and encourage cultures of openness and participation. Managers must encourage learning and implement transparent, fair reward systems for hard work and novel ideas. Lastly, these companies' strategy is often short-term, and they must develop a long-term mindset and mission statement to combat this. A model summarizing the resource and capability-based understanding of how long-established, niche-technology SMEs can work to improve their innovation capacity was created, and should contribute to a more thorough managerial comprehension of organizational factors essential for this type of firm.

Keywords: corporate culture, idea management system, innovation capability, internal communication, mission statement, niche technology, processes, resources, SME, strategy

List of Acronyms

Below is the list of acronyms that have been used throughout this thesis listed in alphabetical order:

ERP	Enterprise resource planning
IP	Intellectual property
NPD	New product development
R&D	Research and development
SCM	Supply chain management
SME	Small and medium-sized enterprises

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Introduction

In today's rapidly-changing business environment, fast adaptation to changing market characteristics and customer preferences is essential for a company to thrive. Accordingly, Franko (1989) suggests a direct correlation between the economic growth of a company and the business' investment in R&D, and that innovation is thus crucial for its prosperity and for building and sustaining competitive advantage. Steiber (2012, pp. 7–9) supports this statement by explaining that, to effectively tap opportunities in the changing external environment, organizations need to be ambidextrous, supported by innovation, and constantly able to be renewed. Unfortunately, companies that lack a clear mission and path of being innovative tend to get stuck in old, fixed processes and continue to exploit their existing products or services, instead of taking the step to work on exploring new options and alternative ways of exploiting innovation (Steiber, 2012, pp. 7–12).

1.1 Transforming into an Innovative Organization

Companies that experience resistance when trying to change in the required direction, or that lack guidance on how to implement an attempt at increasing innovativeness, have been noted to primarily have one thing in common. These companies are often characterized by internally resistant organizations that are primarily focused on maintaining their existing operations (Trimble, 2013). This means that even if an attempt is made to increase innovation within the company, it is, in various ways, too locked-in to carry out the change (Steiber, 2012, pp. 7–12).

Additionally, Steiber (2012, p. 1) suggests that the majority of the current research portfolio on innovation is fragmented between different perspectives. What is frequently addressed in such literature is the idea that firms striving to increase their innovativeness will benefit from addressing technical innovation, however, Steiber (2012) states that organizational innovation is as important. Steiber (2012, pp. 5–6) further recognizes that both firms and researchers tend to embrace a "new-to-the-firm" mentality, attempting to implement technologies and ideas from outside the company, rather than using the potential already present within the organization. Organizational innovation highlights this issue, and emphasizes the use of organizational methods to improve the firm's current performance (Steiber, 2012,

pp. 5–6). This can be done by changing, and/or increasing the efficiency of, the firm's business practices, internal and external relations and communication, resource management, mechanisms for learning, and the organizational structure in general (Steiber, 2012, pp. 5–7).

However, firms with a lower amount of resources are not necessarily less innovative. The level of innovativeness of resource-rich versus resource-lacking firms have been shown to differ depending on a number of situational factors, including market size, competition level, and manufacturing intensity (Katila and Shane, 2005, p. 824). Based on the results of Katila and Shane (2005, p. 824), for companies that fall somewhere in between the two extremes of large, established firms and small, new startups, there is a risk that they will not be as innovative in any situation as they would have been, had they been at the appropriate extreme.

Derived from the aforementioned insights about innovation, Steiber (2012, pp. 13–22) further confirms that to make the change towards becoming an innovative organization, the change must be thoroughly planned out and analyzed before being exploited. It is emphasized that this, along with building a rationale and desirability for changing, is of utmost importance, but that a large majority of the companies within the modern-day, high-velocity external environment lack feasible, supported, and appropriate alternatives to easily implement within the organization with the aim of increasing innovation capacity (Steiber, 2012, pp. 13–22). Löfsten (2016) states that because of the costs related to market and technological development and integrating knowledge into the organization, and the limited resources of small, independent firms, they naturally face difficulties in developing innovation capabilities.

The question thus arises of how such a company, characterized by poorly-functioning innovation mechanisms, can manage the change of going from being relatively stuck where it is, to being able to transform into an organization capable of exploiting and exploring market potential through using either existing resources or ones it can acquire and integrate efficiently.

1.2 Background

To more descriptively frame the issue presented above, a handful of literature topics need to be discussed in Section 1.2.1. Potentially investigating such an issue also requires a company that well-represents the category of firms affected by the issue, as of which will be presented in Section 1.2.2.

1.2.1 Literature Background

To accurately provide recommendations related to improving innovation processes, knowledge of a multitude of concepts is beneficial. The current popular discourse on innovation has a tendency of focusing on the importance of idea generation and creating the optimal environment in a company to facilitate the easy emergence of

innovative, disruptive, new ideas (Trimble, 2013).

However, according to Govindarajan and Trimble (2013), the process of successfully devising an innovation idea and bringing it all the way to market is a "two-part challenge" involving both ideation and execution, with an effective implementation of the latter often conflicting with effectively conducting the former. Balancing these two aspects simultaneously depends on having a level of organizational ambidexterity (Grant, 2018, pp. 204–205) to both exploit the current operations in the most efficient ways possible and explore new avenues for the company to take with regard to innovative ideas.

There seems to be a general recommendation in the existing innovation literature to provide organizational ambidexterity by way of structural ambidexterity (Grant, 2018, pp. 204–205), often in the form of building a dedicated team or department for handling innovation work (O'Connor, 2008, p. 319). The idea is to give this team freedom from the constraints of the ordinary company structure in order to focus on innovation work in a more dynamic way (O'Connor, 2008, p. 319). This is naturally more feasible for larger organizations with more human and financial resources, which gives rise to the issue of how to achieve ambidexterity in a relatively-speaking smaller and less resource-rich company. One alternative could be contextual ambidexterity, with the same organization "pursuing both exploratory and exploitative activities" (Grant, 2018, p. 205), but in that case the "management systems" and "individual behaviors" would have to be changed to support innovation work (Grant, 2018, p. 205).

A related issue that has also been stated is that if a dedicated innovation team is created, it must be kept outside of the "regular" structure of the company, i.e. not pulled back into the regular organization, even when an innovation has been "delivered" (Trimble, 2013). Not only that, but Schilling and Hill (1998, p. 74) state that the new product development team should include members from a "diverse range of functions" to facilitate better coordination, but this would naturally lead to further human resource strain on a small company. These points bring up an issue present in small companies that is worthy of investigation: that of a lack of resources and what the firm can do if keeping a significantly-sized team is not an economically feasible option. It also gives rise to the more general issue of what the best type of overall organizational structure is for an SME of this type, and, specifically for one in great need of change, how the structure can be altered in a speedy and effective way.

Importantly for the issue of innovation work in established SMEs that are in need of organizational change, is the idea that no lone person can be in charge of innovation in its entirety. Although a single creative employee may be able to come up with the idea, due to the issue that the effective execution of bringing the innovation from an idea to a working product or service will, by definition, come into conflict with the existing company structures and processes (by virtue of it being an idea for a product or service different to those which the company currently pursues and

produces), collaboration and teamwork in this process is necessary in order to get over the barriers that will almost certainly arise (Lorsch and Lawrence, 1965; Hurley and Hult, 1998; Hauschildt and Kirchmann, 2001; Montes et al., 2005). It is for this reason essential that more empirical insight is gained into the effects on product innovation by culture as well as collaborations and communication with customers, suppliers, partners, etc., in the aforementioned type of company. Comparing such empirical results with the existing discussions in the literature on the importance of teamwork for innovation may yield interesting results specific to these relatively small firms, generally with comparatively few resources.

Because of the existence of the aforementioned issues surrounding the implementation of steps to achieve organizational ambidexterity, and the lack of suitable directions in existing literature, more empirical analysis is needed in order to efficiently assess the current innovation capabilities of established SMEs in need of organizational change, as well as identifying what potential changes could help this type of company achieve the balance of exploration and exploitation needed for market success. To perform such empirical analysis of mature SMEs stuck in established processes, a deep understanding of a number of additional topics and areas is vital. These are mentioned and discussed below.

Ideation, the act of generating ideas, is by its very (creative) nature a difficult process to linearize and perform "on demand." Because of this, a company wishing to do so must possess a search process, in which it scours the market and communicates both internally (between employees and departments) and externally (with partners, competitors, suppliers, and customers) in an attempt to identify what the next direction of innovation should be (Teece, 2007, p. 1322). For established technology SMEs, especially those with relatively limited financial and human resources, but yet with long-standing customer relationships and market knowledge, guidance on how to design and implement a suitable, practical, and thorough search process is therefore of great interest.

Hurley and Hult (1998, p. 45) describe that a "tolerance for conflict and risk" is necessary for innovation work. The supposition that mature, established companies that nevertheless are small in size (and especially ones with relatively low levels of revenue) have had trouble with growth gives rise to the idea that they perhaps have not taken enough risks. This assumption must be evaluated as, if true, it would provide an area for improvement, but the question becomes whether or not such a company can afford to deal with such conflict and take big-enough risks.

A topic that cannot be ignored in the search for appropriate innovation practices at small, established firms is their business strategy, and specifically how it influences the direction the company takes in pursuit of being innovative and its entire purpose with regard to innovation (Teece, 2007). Therefore, literature related to strategy, and how new strategy should be implemented and supported in a mature SME is highly relevant.

Furthermore, when discussing small, established companies in need of change, it is evident that organizational transformation capabilities, i.e. the ability of a company to alter its structures and processes when an innovation to pursue has been decided upon or its innovation capabilities need to be improved, are of the utmost importance (Teece, 2007, p. 1341). These may appear in the form of a transformational style of leadership (Montes et al., 2005). Other topics pertinent to optimal innovation processes within small, long-established companies include knowledge management (Teece, 2007), communication (Montes et al., 2005; Hurley and Hult, 1998; Teece, 1996), and the roles of externally-facing departments (such as sales, marketing, procurement, internationalization, etc.) for innovation (Andersson et al., 2016; Hurley and Hult, 1998; Lorsch and Lawrence, 1965).

Lastly, when evaluating the innovation capabilities of established SMEs to discover any potential room for improvement, an essential set of literature is that that describes frameworks specifically designed for the assessment of these innovation capabilities. Most past studies have focused on creating frameworks or identifying dimensions to assess the capabilities critical to innovation for large firms (Iddris, 2016; Raghuvanshi et al., 2019). Some literature, for example Börjesson and Löfsten (2012), has even focused on small, high-tech firms, but few studies have chosen to identify dimensions for long-established SMEs, making an investigation into this specific area even more necessary.

1.2.2 Company Background

The Lagercrantz Group is a corporate group headquartered in Stockholm, Sweden, and is focused on offering technical solutions through its subsidiaries that focus on niche technological products and services (Lagercrantz, 2022b; Lagercrantz, 2022c). Each subsidiary within the Lagercrantz Group works independently towards its own goals, which puts decision-making close to the subsidiaries' customers and markets (Lagercrantz, 2022b; Lagercrantz, 2022c). With the group acquiring an average of 4.5 companies per year over the last 10 years (Lagercrantz, 2022a), it certainly exhibits growth, but also constantly strives for its subsidiaries to manifest consistent, long-term, organic growth and higher market shares (Lagercrantz, 2022c). One factor pinpointed by the company that may contribute to this goal is innovation (Representative for Lagercrantz Group AB, personal communication over Zoom, Microsoft Teams, and email, November 2021–January 2022). Lagercrantz therefore offers a fruitful opportunity for insight into this issue, owning a large number of firms that are suitable representatives for the category of companies in question: established SMEs (Lagercrantz, 2022b).

Lagercrantz's representative expressed a desire to analyze and improve the innovation capabilities of a subset of the group's subsidiaries, and three of Lagercrantz's subsidiaries in particular were deemed to fit into the category of companies formerly described, and were characterized by the representative as exhibiting varying degrees of success in terms of product innovation (Representative for Lagercrantz Group AB, personal communication over Zoom, Microsoft Teams, and email, November 2021–

January 2022). This provides a good basis for making comparisons and coming to complete conclusions. In agreement with Lagercrantz, these three companies may not be named for confidentiality reasons, and their locations and the identities of employees are kept anonymous, while still providing the information necessary for a thorough analysis.

Based on information from their respective websites and from Lagercrantz (2022c), the three subsidiaries under investigation share a number of significant similarities, which will be especially important when comparing their structures and processes with literature. They were all founded several decades ago and are therefore relatively mature, i.e. not in the start-up phase. The companies all express that they have a high level of customer interaction, communication, and collaboration to create high-quality solutions tailored to the specific customer. Importantly, all three companies can be defined as small- to medium-sized enterprises (SME) by the 2020 European Union standards (European Commission, 2020), employing about a dozen to less than 100 people, and with annual turnovers of less than 20 million euros. Their level of monetary and human resources, combined with their age, suggests that they have growth potential and that some level of organizational change may be needed to realize this, with the comments by Lagercrantz's representative further supporting this idea. These characteristics, i.e. that they are long-established, relatively small, technologically-niched companies that might benefit from organizational change, place all three companies perfectly within the category introduced in this chapter as being in need of research.

1.3 Problem Description

Sections 1.1 and 1.2 have explained the issue that will be investigated in this master's thesis. The problem being that there exist mature, or established, SMEs that wish to keep up with the requirement of being innovative to survive in the modern business landscape (see Section 1.1), and yet, this type of organization (being defined by a small size, thus commonly with low resource amounts, but simultaneously having rigid processes, therefore being particularly resistant to change) is underrepresented in innovation literature, thus creating uncertainty regarding what steps to take to achieve the needed improvement (see Section 1.2). With the existence of appropriate representatives for this type of company (Lagercrantz's subsidiaries introduced in Section 1.2.2), this problem can be investigated, hence prompting the purpose of this master's thesis, stated below.

1.4 Aim

The aim of this thesis is to draw on problems identified as relating to a firm's current processes in an effort to craft suitable propositions for developing the firm's innovation capabilities.

Based on this purpose, the research questions for this project are to be defined as:

1. What problems do the studied established SMEs tend to experience that influence their level of innovation capability?

2. What organizational factors ought to be implemented by the studied established SMEs to improve their innovation capabilities in a feasible way?

1.5 Objectives

There will be multiple objectives for this project, mainly based on the purpose statement presented in Section 1.4. The goal is to present the following "deliverables" in the thesis report, which will together constitute a theoretical tool or guide for companies of the investigated type:

1. A summary of the elements that need to be in place at a company to facilitate innovation, based on the relevant literature and theory.

2. A mapping and identification of the problems or issues present at the chosen companies, to indicate what must be changed to support the product innovation process, based both on data gathered from the companies and relevant literature.

3. A framework or other type of solution to the discovered issues, based on the conclusions made up until that point as well as the relevant literature.

1.6 Academic Contributions & Industry Impact

The impact of this study will be two-fold, making contributions to both industry and the academic field of innovation management research. As stated in the objectives above, this project will identify the issues most pervasive to innovation at established SMEs in niche technological industries and match those issues with the corresponding solutions found in the general literature. This will result in the presentation of a framework and model for evaluating innovation capabilities, specifically designed to be suitable for application on the aforementioned type of company. The contribution of this model may benefit further research in innovation management academia, hopefully making the analysis of established, mature, technologically niched SMEs easier and more comprehensive, and the model proposed would greatly benefit from being tested in a future, large-scale study. In terms of industry, the impact of this project is straightforward: the findings will be applied directly on Lagercrantz and its studied subsidiaries with the intention of advising them on areas of improvement to make future innovation a more accessible process.

1.7 Delimitations

Due to the desire for a clear focus in terms of topic, the project will not involve investigations into other types of companies, notably large organizations (hundreds of employees or more) and start-ups (generally-speaking, small, young companies lacking an existing, rigid structure). Instead, the focus will undoubtedly be on companies of the type described in Section 1.1 and 1.2: companies of a comparatively small size (tens of employees), with established and stable processes and structures owing to age, but not excessive growth, leading to a desire or outright need for organizational change. This means that the project's research will at most be applicable to such organizations, but because the sample size (three companies) is so small, it cannot be guaranteed that the results will be generalizable to all such organizations. The project should therefore be considered an in-depth analysis and case study of the chosen companies, and the results interpreted accordingly. Important to state here too is that this project will not involve carrying out the implementation of any suggested changes, rather, focusing exclusively on the theoretical side of evaluating and recommending changes.

2

Conceptual Framework

This chapter details relevant theory related to organizational resources and capabilities, and goes through the important areas to look at, in accordance with literature, when assessing a firm's innovation capabilities. Finally, a conceptual framework is presented that summarizes the discussed areas pertaining to innovation capability evaluation.

2.1 The Resource-Based View & Organizational Capabilities

In discussing how firms can develop on the market, it is commonly accepted that a firm's resources and capabilities are determinants of how well it will succeed: the resource-based view of the firm. Organizational capabilities are usually described along the lines of how a firm uses the resources available to it to become competitive on the market (Helfat and Peteraf, 2003; Nonala and Kenney, 1991; Prahalad and Hamel, 1990). More specifically, this involves reconfiguring and developing the resources according to changes in the firm's environment, and doing so continuously and dynamically (Börjesson and Löfsten, 2012), which defines a firm's so-called *dynamic capabilities*. Authors like Christensen (1997) divide organizational capabilities into three categories: resources, processes, and values, while others describe capabilities, as well as assets, organizational processes, information, knowledge, and firm attributes, as examples of a firm's resources (Daft, 1983). Hence, whether resources are a *part* of a firm's capabilities or vice versa, or whether the capabilities simply *rely* on the use of the resources, could be argued contentiously, but what is clear from both Christensen's and Daft's views is that the two factors of resources and capabilities are intertwined and must be discussed together.

Looking more closely at the firm's resources, they are often divided into three types: physical resources (such as equipment and tools), human resources (such as knowledge and skills), and organizational resources (such as planning and coordinating) (Barney, 1991). Leonard-Barton (1992) characterizes a firm's capabilities as being defined through four dimensions: *employee knowledge and skills*, *technical systems*, *managerial systems that guide knowledge creation and control processes*, and lastly, *the values and norms associated with these processes*. Therefore, the processes a firm

carries out (managerial and operational), the various types of resources it has the ability to use (internal competence and physical, technical systems), and the way its organization views the business (the cultural aspect) all have a central impact on the firm's ability to stay competitive in the long-run.

2.1.1 Innovation Capabilities

Innovation is often considered essential for companies that wish to stay competitive, and may even be necessary for their survival (Hurley and Hult, 1998). Börjesson and Löfsten refers to Coff (1997) and Henderson and Cockburn (1994), stating that firms with dynamic capabilities are more likely to achieve product innovation: "high levels of information processing, communication and knowledge transfer are more likely to develop competencies which will result in successful technology innovation" (Börjesson and Löfsten, 2012, p. 152). Therefore, any company wishing to innovate with regard to its products, in an attempt to increase its chances of long-term survival, should first make sure it has the ability to transform and mobilize its resources and capabilities. Aas and Breunig define *innovation capability* as "a firm's ability to identify new ideas and transform them into new/improved products, services or processes that benefit the firm" (Aas and Breunig, 2017, p. 8). However, Aas and Breunig (2017) affirm that the concepts of innovation capability and dynamic capability overlap tremendously, and are therefore "difficult to distinguish" (Aas and Breunig, 2017, p. 8), just as seen earlier in this paragraph. Hence, the concept of innovation capability (or *capabilities for innovation* (Börjesson and Löfsten, 2012)) can also be thought of as: the ability of a firm to use its organizational resources and capabilities to enable innovation.

Innovation capacity (or the capacity to innovate) and innovativeness are sometimes used synonymously with innovation capability. While they are similar, the former refers to the availability of the resources, structures, and processes needed for innovation (Laforet, 2011) and the latter the firm's "capacity to engage in innovation," meaning "introduction of new processes, products, or ideas in the organization" (Hult et al., 2004, p. 429). How that capacity is used is defined by the firm's actual innovation capabilities.

Following the described view on resources and capabilities, Börjesson and Löfsten (2012) investigated the prerequisites for innovation at small, high-tech firms along the five dimensions of: skills, motivational drivers, behavior, business planning and perspective, and external networks. A plethora of additional literature has been written on the topic of categorizing innovation capabilities in various types of companies (Iddris, 2016; Raghuvanshi et al., 2019). In this chapter, the aspects and dimensions found in the literature as being important for innovation are discussed. This discussion includes what each dimension encompasses, why it is relevant for innovation and what the positive actions related to that dimension are, as well as any problems related to that dimension. The following categorization of dimensions was performed by the authors of this report based on how distinct and significant they were in the literature, in an attempt to be both all-encompassing and mutually

exclusive. That being said, there is still some overlap in the dimensions, but that was found to be the case in all frameworks reviewed from existing literature as well.

2.2 Resources

This section contains a presentation of different perspectives on how a company can exploit available resources to promote its innovation capability. The denominated dimensions include what various types of organizational structures can entail, what type of internal competence is considered rewarding, and how financial resources and different types of external linkages can affect the company's ability to cultivate and maintain their innovation capacity.

2.2.1 Structure

When identifying the main attributes of innovation, Raghuvanshi et al. (2019, p.282) highlight the organizational structure to be the prime element. The authors argue that while enhancing a firms innovation capability, the organizational structure and internal processes enables and create the environment in which innovation can be diffused, thus, constitute its foundation.

O'Connor (2008, p. 319) argues for a loosely-coupled organizational unit to handle the development and commercialization of innovations without being obstructed by the rest of the organization, which generally follows codified rules. However, Börjesson and Löfsten (2012) state that small companies tend not to have departments for R&D that are significantly separated from the rest of the companies, and that instead, the employees in these small firms are forced to multi-task to handle all the firm's functions.

Frishammar et al. (2012) found that a team-based structure is the best for organizational learning and collaboration. With regard to the make-up of the firm's teams, based on the discussions by O'Connor (2008) and Tyre and Hauptman (1992), brought up in Section 2.2.2, some degree of "cross-functionality" is clearly positive for innovation, even if that means regulating it to, e.g., specific periods of the innovation process. Hurley and Hult (1998, p. 46)'s summary organizational characteristics relevant for market- and learning-orientations includes the idea that differentiation in diversity and specialization encourages (healthy) conflict, which is good for generating new ideas, but bad for implementing those ideas. This further supports the idea that team make-up should be adjusted depending on the situation or stage that the innovation is moving through.

2.2.2 Internal Competence

Another essential resource, necessary for a firm to be innovative, is its internal competence, or human resources. Lawson and Samson (2001, p. 390) mention that companies need to harness their competence base and internal resources in order to support innovation. This involves maintaining so-called "innovation champions,"

who promote innovation in various ways: technologically (with expert knowledge), business-wise (initiative with creative business ideas), and organizationally (assisting in the organizational processes needed to get an innovation through its stages) (Lawson and Samson, 2001, p. 391).

Romijn and Albaladejo (2002, p. 1064) indicate that for small, high-tech companies, employees should be highly specialized and "experience[d] in science and engineering, rather than [...] general managerial capabilities," in order to increase innovation and learning. Börjesson and Löfsten (2012) state that a high proportion of engineers and scientists usually positively indicates how intensely the firm is pursuing research and development. However, it is certain that the competence of the CEO and managers at these firms is important too, and although the importance of the previous business experience of managers is somewhat inconsistent in literature, Löfsten (2016) found that it has a significantly positive effect on firm survival in the long-term. Börjesson and Löfsten (2012) present that a small company's growth can be assisted by managers with an "entrepreneurial orientation," which they say is comprised of "innovativeness, risk-taking and proactiveness" (Börjesson and Löfsten, 2012, p. 153). They explain this further as a combination of creativity in problem-solving, a willingness to strategically commit resources, even when in uncertain circumstances, and agressively seeking out growth opportunities (Börjesson and Löfsten, 2012, p. 153).

In contrast, O'Connor (2008, p. 323) goes against this, discussing the requirements, in terms of employees, for companies striving towards major innovation, saying that the ideal archetype is a broadly skilled worker who is flexible and can adapt depending on the project, situation, or task at hand, and, lastly, should have "entrepreneurial characteristics." Börjesson and Löfsten (2012) found that the employee skills correlating positively to innovation capabilities were drive, enthusiasm and a high education level. O'Connor states that teams focused on major innovation should include these "multifunctional individuals," rather than a diverse set of niched individuals, who would make up a cross-functional team (O'Connor, 2008, p. 323). This is evidentiated by Tyre and Hauptman (1992), who found that an "overlap between engineering and manufacturing functions" is less useful the more novel an innovation project is. O'Connor (2008, p. 323) also mentions that this type of entrepreneurial employee will tend to move away from large, established organizations if their needs are not met, hinting to that they may flock towards SMEs instead, although most likely the start-up variety.

2.2.3 Financial Resources

The resources available to a company can be seen as the ingredients for innovation; how they are used and exploited are the recipe. Analogies aside, a firm's ability to exploit its available resources to create innovations is part of Iddris (2016)'s definition of innovation capability. These resources come in many different forms: internal (human resources: see Section 2.2.2, technological resources, financial resources, etc.) and external (access to outside technologies and competences: Section 2.2.4).

A seemingly obvious prerequisite for a firm's ability to exploit and capitalize on any underlying innovativeness is access to financial resources: a company clearly needs to fund innovation work in some way, whether that means pouring millions into a large R&D department, or allowing employees an extra hour per week to explore their own projects and ideas, each case has some level of monetary requirement. Amabile (1997, p. 50) references studies that found out that the allocation of special funds for "highly experimental research" and "adequate funding" of development projects aided innovation immensely.

In their discussion about managing resources, Lawson and Samson (2001, pp. 390–391) note that in innovative firms, individuals and teams working on innovation can request funding from a variety of different sources and divisions, increasing the likelihood that innovation stays within the company. This statement is based on the research of large organizations and is inherently problematic when it comes to discussing SMEs who lack large funding pools.

An argument against the idea that firms with less financial resources have a harder time dealing with innovation is brought up by Teece (1996), in which he argues that in places with easy access to venture capital communities and investors, firms have the possibility of receiving the capital required for innovation, regardless of their existing internal resources. Nevertheless, the transaction costs are likely to always be higher dealing with external venture capitalists and investors, than with internal forms of funding. Therefore, SMEs are, by their very nature, required to find alternative ways around the issue of financial resources to increase their innovation capabilities.

2.2.4 External Linkages & Open Innovation

Regarding the implementation of innovation, or, to put it more clearly, the development work needed to turn innovative ideas into working products or services (something many innovation capability frameworks discuss in one way or another (Iddris, 2016; Raghuvanshi et al., 2019)), an inherent problem with SMEs is their relative lack of human capital to perform these development tasks. Objectively speaking, they have several options to get around this problem: decreasing work on other tasks, abandoning other projects, or implementing time-saving systems to focus more on the innovation in question, but one solution, which will be described in this section, is outsourcing their innovation work to other firms and collaborating with external actors.

Following the resource-based view on innovation, networks can allow small companies to access other resources and capabilities not available to them otherwise. With Lichtenthaler (2008, p. 155) finding that firms should *proactively* open their doors to a more externally-centered, open innovation process in order to enable "important strategic innovations," such a process is of great interest for SMEs in dire need of strategic innovation.

In their extensive literature study on open innovation, Hossain and Kauranen (2016, p. 67) found that SMEs engage in open innovation more often than previously thought, but that new entrants use this method of innovation more frequently than incumbent firms (the subjects of this thesis project).

Hossain and Kauranen (2016, p. 67) indicate that SMEs should perhaps focus on maintaining intensive collaborations, or at least have a balance between intensive and extensive collaborations, as extensive collaborations are very difficult for SMEs to manage based on their lower resources.

Hossain and Kauranen (2016, p. 61) describe that external research organizations, especially universities, are prone to interact with SMEs, "providing a collaborative environment" and creating further connections in the innovation network. Universities can interact with companies, especially ones close-by, using either formal or informal networks (Deeds et al., 2000). Börjesson and Löfsten found that cooperation with universities had a large effect on innovation performance, but that small firms have a hard time using these external linkages, theorizing that it might be due to a "lack of resources and poor absorptive capacity" (Börjesson and Löfsten, 2012, p. 169).

Hossain and Kauranen (2016, p. 66) summarize that to be successful, SMEs need to create a balance of openness: too much and they incur higher costs, too little and they miss opportunities. Striking a balance between internal initiative and openness is also important because "excessive openness has a negative effect on innovation performance" (Hossain and Kauranen, 2016, p. 67). One essential aspect of this is intellectual property (IP): in their collaboration SMEs must be extra-careful to protect their IP while not letting that impede the open cooperation (Hossain and Kauranen, 2016, pp. 63–65, 67).

An important note made by Hossain and Kauranen (2016, pp. 66–67) is that open innovation seems significantly more suitable and less risky for radical innovation (creating completely new products) than incremental innovation (improving existing products). This offers a concrete direction to follow for SMEs wondering if they should outsource innovation.

Lichtenthaler (2008) found a positive relationship between the acquisition (absorption) of external technologies and their exploitation (commercialization), and asserted that firms must engage in both practices in order to keep up in the competitive markets of today. Hence, if this relationship is at all causal, then SMEs should attempt to acquire or use more external technologies to, at the very least, inspire more open collaboration for developing and selling innovations.

Because of the generally informal processes surrounding R&D at SMEs, they are said to face more challenges when it comes to being open to formal collaborations than large organizations do (Hossain and Kauranen, 2016, pp. 64–65, 67).

When attempting to increase their innovation capabilities by means of open innovation, these companies must understand that the benefits will not readily show themselves immediately. It may take time for the full potential of a collaboration to be realized and might by that time have been forgotten and therefore the results gone unnoticed. As stated by Hossain and Kauranen (2016, p. 67), openness has "fewer measurable benefits but [...] brings some indirect benefits," such as "connectivity, awareness, and reputation" (Hossain and Kauranen, 2016, p. 64), all certainly positive aspects for an SME fighting for success.

Although firms should open their doors to collaboration with outside actors, Teece (1996) raises the issue of virtual corporations (who essentially outsource or subcontract everything possible) not being viable in the long-term, as their subcontractors can easily move into the research space, becoming a superior competitor to the firm in question. For this reason, even if open innovation has numerous benefits, it must be balanced with high internal competence in some areas.

2.3 Processes

Within this section, a review of various distinct internal processes will be presented. These include internal communication and organizational learning, market foresight and intelligence, as well as the management and creativity of ideas, all addressed to impact a firm's innovation capability.

2.3.1 Internal Communication & Organizational Learning

Related to both structure (Section 2.2.1) and internal competence (Section 2.2.2), *efficient and effective* communication and collaboration between a company's "subunits" is necessity for innovation, so that ideas, information, and learning can flow throughout the organization Frishammar et al. (2012, pp. 523–524), limiting the existence of any silo mentality within the company. Accordingly, March (1991, pp. 83–84) states that those organizations that develop effective instruments for coordination and corporate information exchange most certainly receive better results and increase their likelihood of achieving competitive advantage through innovation than those that are more loosely coupled. Löfsten discusses that innovation is more likely to be facilitated in firms with "high levels of information processing, communication and knowledge transfer" (Löfsten, 2016, p. 314), further strengthening the importance of internal communication as a capability for innovation.

One simple variable to the equation is for the employees to know who to contact or collaborate with when exploring an idea or, in general terms, working with innovation (Björkdahl and Börjesson, 2012, p. 180).

To increase the success-rate of an organizations innovation efforts, organizational learning is described as an important aspect, generating and diffusing knowledge within the organization (Björkdahl and Börjesson, 2012, p. 178). As innovation often entails uncertainty, missteps, and unpredictable or unexpected events through-

out its diffusion, learning from previous innovation efforts and cross-learning within the organization is explained to be of significant interest (Björkdahl and Börjesson, 2012, p. 178).

In addition, Keskin (2006, p. 411) assert that learning throughout the organization is an important dimension for fostering innovation, and thereby staying competitive, especially when looking at SMEs. However, to promote collective and organizational learning, learning through education is argued to be insufficient, even if it is considered favorable. Instead, Keskin (2006, p. 411) claims that the dissemination and collection of all employees' learning within the company (knowledge sharing), combined with the environment in which they work (including social factors), facilitate organizational learning. Accordingly, implementing mechanisms for sharing knowledge and lessons learned between departments, units, and teams is argued as crucial for SMEs innovativeness. Such an example is presented by Björkdahl and Börjesson (2012, p. 180), claiming that it is favorable to move employees between units to utilize cross-functional knowledge and experience, and to employ insights from previous efforts.

Jain (2013, pp. 1683–1686) further recalls that knowledge used to create new innovations can be described by a learning curve, accumulated by learning by doing, and that both individual skills and knowledge within the collective is important for innovation in organizations. Illustrated, the learning curve appears when, for example, an individual invests in learning a new technology without any prior knowledge within that technology. Later, when the same technology is used to innovate for the second time, the required investment in that innovation is reduced. Thus, the accumulation of learning increases the productivity and, if performed in units, the shared experience too (Jain, 2013, pp. 1684–1685).

Related to the aforementioned dimension of organizational communication and collaboration, viewed as favorable for increased innovation capacity (see 2.3.1), Jain (2013, pp. 1685, 1698) argue that the combination of proficient individuals, coordinated teams, and collective experience (relational experience between pairs of individuals) together form the foundation of which knowledge facilitates an organizations innovative capability. However, even if repeated activities in a specific domain foster deeper understanding and cross-domain connections, more recent experience has been shown to dominate over older experience, as the latter is more likely to be forgotten, thus, discounted when working with innovation (Jain, 2013, pp. 1694–1695).

Additionally, Raghuvanshi et al. (2019, p. 280) emphasize commitment to learning as another crucial factor for an organizations innovation capability. The authors explain that, to enhance the climate of learning, employees must carry motivation to learn through the knowledge development, thus, it is not adequate to only obtain systems for learning (Raghuvanshi et al., 2019, pp. 280, 283).

2.3.2 Market Foresight & Intelligence

Another central aspect in companies having good innovation capabilities is their market/industry environment and their abilities to understand that environment and use that understanding in the development of innovation. Lawson and Samson (2001) describe this as "organizational intelligence" and say that firms need to be "able to generate, communicate and act on the most relevant, up-to-date information available about their environment" in order to "identify new avenues for investigation and to more quickly eliminate unprofitable options" (Lawson and Samson, 2001, p. 391). Keskin (2006, p. 411) found that SMEs require a market-orientation in order to learn: "collecting and using customer information, developing and then implementing marketing plans, guides the learning and innovation of SMEs." Assink (2006, p. 225) presents that a lack of market sensing, and future-thinking regarding the market, is a core inhibitor of innovation.

As mentioned in Section 2.3.3, this involves communication with customers, suppliers, and competitors for learning purposes. Lawson and Samson (2001, p. 392) recommend that firms make sure employees are aware of customers and their needs and problems. Hurley and Hult (1998, p. 46) mentions both that market information should be shared or spread throughout the organization to increase responsiveness, but also that it should be generated through involvement with suppliers and customers. An important action that companies can take is to observe their customers in "everyday settings," in an attempt to come up with solutions for problems that the customers cannot clearly articulate (and therefore need to be directly observed) (Lawson and Samson, 2001, p. 392). Analyzing competitors to exploit their weaknesses, imitate their strengths, and ensure differentiation are all aspects recommended by Lawson and Samson (2001, p. 392).

Assink (2006) describes that standard market research should only be done for incremental innovations, and is detrimental to work on radical innovations. This is not difficult to imagine, as the market will only indicate what *current* technologies exist and where the industry and science in generally headed, while radical innovations may take inspiration from these, they generally require more out-of-the-box thinking and creativity (see Section 2.3.3). In Assink's words, "Markets that do not exist cannot be analysed" (Assink, 2006, p. 225). Complicating what is said in Section 2.3.3 regarding customer involvement, Assink (2006) explains the issue of firms staying *too close* to their customers—these often miss out on truly disruptive developments. Gilbert (2003) explains that firms should target emerging markets and low-cost applications when it comes to more radical innovations. While the conclusions regarding whether or not entrance into international markets supports small-firm survival (Löfsten, 2016), Börjesson and Löfsten state firmly that it is the "adaptation to new markets and being able to make rapid changes" that is important for the innovativeness of small firms (Börjesson and Löfsten, 2012, p. 169).

2.3.3 Management of Creativity & Ideas

Another dimension brought up in many innovation capability frameworks is that of creativity, exploration, and idea management. Björkdahl and Börjesson (2012) explain that "idea management" is the set of systems, structure, and routines for managing and supporting the creation of innovation ideas. They mention that companies must have a way to *systematically* evaluate these ideas, because in theory, a company's employees could be very creative and inventive, but have no clear way of exploring or promoting those ideas (Björkdahl and Börjesson, 2012, p. 178). Björkdahl and Börjesson (2012, p. 178) also note that idea management is highly related to external linkages (see Section 2.2.4) through the management of customer knowledge (and supplier knowledge (Raghuvanshi et al., 2019, p. 280)), and market analysis (see Section 2.3.2) through linking information from the market to the development of new ideas.

Although Iddris (2016) describes creativity and idea management as two separate dimensions, even in his framework, they are very intertwined. Both bring up the necessity of having reward systems for supporting the creation of ideas. Boeddrich (2004, pp. 278, 282) solely recommends "exclusive individual rewards for good ideas that are implemented." Interestingly, an issue discovered by Amabile is that the "promise of rewards" should not be used as the *encouragement* for coming up with ideas (Amabile, 1997, p. 39), as that "undermines [employees'] creativity" (Amabile, 1997, p. 41), but rather that rewards should solely be presented as bonuses for great ideas. This fine difference in how the perception or presentation of the rewards affects their effectiveness (Amabile, 1997, p. 41) means that companies must be very careful in how they implement such systems. Amabile gave an example of a good reward: "[recognizing] outstanding performance by approving the allocation of additional technical resources to its engineers" (Amabile, 1997, p. 45), or in other words, something that motivates employees to do something good but that is not the goal of that action. Reward systems are discussed further in Section 2.4.1.

Another aspect firms should have in mind when planning how to manage ideas it to allow for experimentation by employees and allow them to take on difficult tasks, making sure a culture is instilled in them where they know that if they fail, that is okay (this is highly connected to culture in Section 2.4.1) (Iddris, 2016).

Amabile et al. (1996) discovered that giving employees *challenge*, but not *a too high workload*, as well as making sure team members support and encourage each other, made easier by diversity and openness (Amabile et al., 1996, p. 1160), had significant effects on their creativity. However, they also found that freedom in how employees work and the resources they have access to have some effect, but not as large an effect as the previous aspects (Amabile et al., 1996). Thus, it can be said that employees should be given *some* extra free time or flexibility in their schedule to maximize creativity, and they should have at their disposal at least the amount of resources (materials, funds, facilities and information) necessary to do their work (Amabile, 1997, p. 55), but that the company does not have to go overboard with providing excessive extra material.

A balance must be struck between having an idea evaluation phase that is fair and allows a wide variety of ideas to be discussed and tested, but that is not too extensive, spending excessive time on ideas that will not make it to production.

Boeddrich (2004, p. 276) describes that to effectively manage ideas and creativity, the firm should set "strategic guidelines" for ideas, so that they are in line with the firm's vision. He also states the importance of employees and managers being able to deliver ideas to and retrieve them from a clear place or system, so there is no confusion to result in the loss of ideas (Boeddrich, 2004, p. 279). Boeddrich (2004, p. 276) translates Geschka and Schwarz-Geschka's idea, that while all employees should feel welcome to submit ideas to the "idea management system," the evaluation of those ideas (choosing which ones to develop further) should be made structured, transparent, and rule-based by (a cross-functional set of) the management, which may ensure that the chosen ideas follow the company's vision. Amabile (1997, p. 55) says that this judgment of ideas should be fair and constructive and there should be no "excessively negative criticism."

A number of additional requirements for an idea management system, listed by Boeddrich (2004, p. 277), are: a "definition of company-specific idea categories" and an "investigation of stakeholders in the structured fuzzy front end and establishment of their participation." What the last point implies is that stakeholders such as the firm's customers and suppliers, who will eventually have to take part in the new product or service, should be involved from early on in a constructive way. This may have positive effects such as suppliers' increasing willingness to invest in the innovation's surrounding activities or increased customer loyalty (Raghuvanshi et al., 2019, p. 280).

After going through the process of evaluating the collected ideas, the next step for a company attempting to innovate is the actual implementation process of the chosen idea. What is meant by this is the set of steps taken to transform the new idea into an actual working product, service, and/or business model (Björkdahl and Börjesson, 2012): there is clearly not much use for a company that is great at coming up with ideas but has no way of doing anything profitable with them. Staying within the boundaries of innovation capabilities, one can say that the implementation process relies on the existence of other well-functioning organizational capabilities such as the ability of the organization to reflect on its current operations, the ability to transform and learn (to pursue new business activities and business models), and the ability to integrate technology and business development (Björkdahl and Börjesson, 2012).

2.4 Culture

Another dimension related to a company's innovation capability is its culture. The following sections will thereby address the aspects that are important to consider with regarding corporate culture, to promote the execution of various innovation efforts, as well as a presentation of what role leaders may play within this process.

2.4.1 Company Culture

Referring to the reviewed literature, a company's culture is brought up in almost every single framework as being essential to evaluate when it comes to innovation capabilities. The authors define corporate culture as "a system of shared values [...] and norms that define appropriate attitudes and behaviors for organizational members" (Nacinovic et al., 2009, p. 377). Nacinovic et al. (2009, p. 376) states that among the various factors that affect innovation in a firm, corporate culture is one of the most important. Within the realm of culture, Nacinovic et al. (2009, p. 380) found that firms must develop effective reward systems to foster and encourage innovation. By definition, these systems reflect the organization's values, beliefs, and norms, as they define who gets rewarded for what (Nacinovic et al., 2009, p. 377).

Hasanudin et al. (2018, p. 238) found a strongly positive relationship between companies having reward systems and their employees both being satisfied with their job and showing better performance and dedication to their work. Hasanudin et al. (2018, p. 239) also propose that in addition to making sure that employees are provided with the necessities for happiness and enjoyment, companies should make sure that there are no feelings of unfairness among the employees, especially regarding promotion or salary. These findings suggests that reward systems need to be transparent and take everyone at the company into account, so that everyone has the possibility to be rewarded for their efforts, even if these efforts present themselves in different ways (e.g. sales work versus R&D work). This is supported by Nacinovic et al. (2009, p. 377), who say that the preconditions of "full and open transparency regarding awards, the communication of the availability of the rewards, the criteria to be satisfied, and the identification of the award recipients" are all crucial in having a functioning reward system. Nacinovic et al. (2009, p. 377) propose that to achieve a *fair* (still financially-based) reward system, the company should prefer bonuses based on individual performance and merit, instead of profit-sharing programs through which all employees receive the same amount. Individual contributions must be recognized (Nacinovic et al., 2009, p. 377) and rewarded regularly rather than occasionally (Nacinovic et al., 2009, p. 379). To emphasize the importance of reward systems for SMEs specifically, Nacinovic et al. (2009, p. 381) suggest that firms can use reward systems to increase their "level of innovation without heavy financial investments into R&D."

The findings of Hasanudin et al. (2018, p. 238) also included that individual performance is highly influenced by the managers' attitudes towards innovation and that an employee's satisfaction at their workplace is affected by whether or not they receive relevant and accurate information, assisting in decision-making. Based on this, it seems that for a company to increase its propensity for innovativeness, it should make sure that its managers promote an innovation-centered mindset towards all employees (to increase overall performance), and that they provide the employees with relevant information connecting their individual job tasks to the overall direction and strategy of the company, creating a sense of purpose and dedication to the company's long-term success.

Nacinovic et al. (2009, p. 378) motivate that the tolerance of failure is a central aspect in a positive corporate culture, and that failure should be seen as part of the process of learning and experimenting. Teece (1996, p. 206) also brings this up as essential in a firm's culture for new product development, in addition to employees having the right to challenges established ideas, and the firm being *open* (to external communication, external technologies, and internally too). Regarding innovation implementation, Teece (1996, p. 46) lists a different set of cultural norms needed: "teamwork, flexibility, trust, and hard work."

2.4.2 Leadership Support

As summarized by Raghuvanshi et al. (2019, p. 281), the leadership context within a company plays a central role in the ability of that firm to be innovative, as it is the leaders (managers and owners) who are able to take the largest steps to make sure that the environment within the firm fosters innovation and learning, and it is largely their responsibility to build up the systems and tools needed by employees for innovation.

Lawson and Samson state the difficulty of being innovative when a company manages "existing" operations and innovation separately, saying that innovation should be made "an organization-wide effort that recognizes the interdependency with the mainstream and manages accordingly" (Lawson and Samson, 2001, p. 382). Managers should keep in mind the company's core competencies while developing new products (Lawson and Samson, 2001, p. 387), so as to integrate development in an effective way. In order to create diversity of thought and creativity, leaders need to hire motivated experts with both a sense of individuality and a team-centric mindset (Lawson and Samson, 2001, p. 394).

Harborne and Johne (2003) found that a controlling leadership style is not effective for innovation. Instead, leaders need to empower their team to take initiative almost autonomously, through "participative decision making" (Hurley and Hult, 1998, p. 46), but this requires the leaders doing everything in their ability to make sure the team gets and shares information (related to Section 2.2.4 & 2.3.1), gets the resources needed (related to Section 2.2.2 & 2.2.3), is clearly structured and understands that structure (related to Section 2.2.4 & 2.2.1), and has an accountable, positive culture with strong values (related to Section 2.4.1) (Harborne and Johne, 2003, p. 122). Leaders also need to allow employees some time for creativity (Lawson and Samson, 2001, p. 394).

Harborne and Johne investigated the ideal leadership style for product innovation, finding that innovative firms had leaders who did not just communicate with their teams regarding formal, work-related matters, but also had informal, interpersonal communication with team members. They also found that hierarchies only existed for formal purposes, but that on the project-level, the leader of a certain initiative did not have to be the formal "boss." Thirdly, they concluded that a vision for the innovation project was communicated recurrently by the leaders at innovative firms,

and that those leaders helped the team members feel empowered and encouraged to take their own initiative towards goals. Lastly, relevant to Section 2.4.1, Harborne and Johne found that leaders ensured that rewards were focused on project outcomes. (Harborne and Johne, 2003, p. 125)

Highly related to strategy (Section 2.5.1), Keskin (2006, p. 412) states that marketing plans at SMEs are usually "embedded in their operations and in the minds of their owners/managers," and that therefore, the leadership (the managers) should be more vocal, clear, and explicit towards employees regarding their strategies and philosophies—the leadership has to actively and loudly support and promote innovation plans to (and *with*) the organization, not just keep them embedded in the firm's processes.

2.5 Direction

What is presented within this section is the strategy, vision, and mission of an organization, of which all can be addressed to affect the direction a company is heading, thus, influence its innovation capability.

2.5.1 Strategy, Vision & Mission

A central aspect, necessary for functioning innovation capabilities, is a "good" company vision and strategy (Lawson and Samson, 2001; Björkdahl and Börjesson, 2012; Rådesjö and Sandström, 2013; Bankel and Blomqvist, 2019). The terms *strategy*, *mission*, and *vision* all aim at putting the company's focus on the long-term to achieve sustainability, with the *strategy* being the plans for how compete, the *mission* being the company's purpose and overall goal, and the *vision* being the future potential of the company: what it "wants to become."

The performance of small firms is affected extensively by their strategy (Lindelöf and Löfsten, 2006), and Keskin argues that, to be innovative, SMEs need a market- and learning-oriented strategy, but that SMEs theoretically face a number of issues in creating strategies for this that large firms do not: "deficiencies [in] resources and range of technological competencies," greater manager influence on decision-making, dependence on fewer customers/suppliers, and a greater focus on current operations (Keskin, 2006, p. 397).

While Analoui and Karami explain that it is not completely evident that high-performing companies have "more comprehensive mission statements" than their low-performing counterparts, they do nevertheless recommend that the CEOs of SMEs develop mission statements for the simple reason that they make it easier to plan business strategies and promote "shared expectations among [...] employees" (Analoui and Karami, 2002, p. 13).

Bart (1998) states that the mission statements of innovative firms create action: they inspire and guide their employees towards a long-term goal. Bart (1998) fur-

ther concludes that innovative firms tend to include word of the following subjects in their mission statements (either more frequently or more clearly than non-innovative firms): their strategy for staying competitive, the behaviors employees are expected to exhibit, the specific technologies focused on, their concern for people involved and affected, their vision and direction, and their financial objectives. In contrast to Bart (1998), Alavi and Karami (2009) concluded that prioritizing financial goals in SME mission statements was associated with slightly lower performance. Importantly, Alavi and Karami (2009) found that the act of involving not only top-level executives but also non-managerial employees in the creation of a mission statement was correlated with higher company performance.

It seems that the clearer the company can be in defining who and what it will attempt to affect and how it will do so in the long-term, the more easily employees tend to follow these "directions." Also, if financial goals are to be included, the must not be prioritized as "the most important part" of the mission, but should nevertheless be clear. Lastly, lower-level employees must be included in the mission statement synthesis process to create a sense of inclusion and consensus among the future followers of that mission.

According to Ates et al. (2013), a key issue with SMEs is their short-term outlook and focus on flexibility. This not only hinders the creation of an effective company vision, but leads to a short-sighted management style for fear that excessive planning would create a bureaucratic environment (Ates et al., 2013, p. 44). Ates et al. (2013, p. 44) subsequently recommend an external orientation with focus on the environment, theorized to lead to long-term performance. Due to the difficulties SMEs have with the concept of mission, Ates et al. (2013, p. 47) propose that they should be assisted in developing strategies without forcing them to use the "complex methodologies used by large organisations," but rather "bottom-up approaches" based on SMEs' existing managerial cultures. Therefore, if SME executives could bring themselves to formulating a long-term mission statement, the external environment, long-term plans, and future opportunities would take a front seat in the development of company actions and goals.

2.6 Framework for Evaluating Innovation Capabilities

Table 2.1 presents a framework for evaluating a firm's innovation capabilities. The framework is based on the four major areas or dimensions discussed in this chapter. While they have been kept quite broad for simplicity's sake, each area does one or several narrower sub-categories of dimensions to evaluate, in line with the discussion above. Table 2.1 further includes some major examples of concrete, positive recommendations for companies regarding each dimension, all derived from the literature presented within this chapter. The applicability of this framework to established SMEs will be evaluated in Chapter 5, and any necessary adjustments based on that evaluation will be presented there.

Major Areas	Sub-Dimensions	Major Examples
Resources	Structure	Team-based with some cross-functional aspects
	Internal Competence	Broadly-skilled, flexible, initiative-taking workers
	Financial Resources	Adequate funding for creative work and concrete development projects
	External Linkages & Open Innovation	Few, intense collaborations; Protect IP
Processes	Internal Communication & Organizational Learning	Systems for sharing knowledge; Cross-functional learning; Clear system for knowing who to contact
	Market Foresight & Intelligence	Share customer info to employees; Observe customer actions; Target emerging markets
	Management of Creativity & Ideas	Structured idea management system; Reward good ideas directly; Challenge employees & give them some freedom; Clear strategic guidelines for ideas
Culture	Company Culture	Fair reward systems; Mindset that failure is okay and norms can be challenged
	Leadership Support	Friendly, open & empowering, not controlling, leadership style; Be vocal about strategy
Direction	Strategy, Vision & Mission	External, long-term focus; All employees involved in creating mission statement

Table 2.1: A framework for evaluating the innovation capabilities of a firm through the categorization of various factors into their respective areas or dimensions

3

Methodology

This section details the approach for carrying out this project. To successfully complete this project, it was required that an exhaustive project planning phase had been carried out, before moving on to the main part of the project which included data collection of various kinds, analysis of the collected theory and data, an evaluation and discussion phase for coming to conclusions and generating results, followed by, lastly, a presentation phase.

3.1 Research Design Strategy

The overall strategy for conducting this research was of a qualitative nature. There are several reasons for this. One of the main and perhaps most significant reasons for this choice was that qualitative research allows the researchers to understand the perspectives of the people being studied (Bell et al., 2019, p. 366). The relevance of this is made clear when considering that the project's goal was to develop new ways of improving the companies' innovation processes and capabilities. Innovation processes are, by their very nature, less systematic, uniform, and repeatable than for example manufacturing processes, and involve the teamwork and creativity of people. It was therefore of the utmost importance that this project's research took into account the opinions and perspectives of the people involved in this process to, as described by Govindarajan and Trimble (2013), obtain an in-depth understanding of the topic being studied.

Another benefit of performing a qualitative study comes with its emphasis on context, described by Bell et al. (2019, pp. 367–368), underlining the endeavor to obtain an explanation rather than a description. In more detail, this tendency within qualitative studies brings about an understanding of the actual happenings within the setting being investigated. This is highlighted by Bell et al. (2019, p. 368) as favorable when trying to reach a contextual understanding of social behavior, which is beneficial for grasping actions that, for example, may seem irrational at first.

Along with its emphasis on context, qualitative research puts a large focus on process as well (Bell et al., 2019, p. 368), which is of course beneficial for the task of analyzing innovation processes. By default, qualitative research provides an op-

portunity to observe how various events develop over time and in what way their elements interconnect, thus clarifying the underlying situation from which processes emerge (Bell et al., 2019, pp. 68–69).

A qualitative study is further characterized by a limited structure, minimizing predetermined expectations and assumptions from the researchers (Bell et al., 2019, p. 360). It is stated by Bell et al. (2019, p. 360) that a deeply structured method limits the degree to which perspectives of the people being studied can be revealed, thus hampering the opportunity for insights to arise. Researchers using structure to a great extent may therefore overlook or miss these insights. A qualitative research strategy, on the other hand, steers the research orientation and offers a favorable level of flexibility, granting way for an iterative structure that lets theories and concepts emerge inductively from the data collected throughout the process (Bell et al., 2019, p. 360).

Additionally, as this master's thesis project falls clearly within the area of business research, it is essential that at least two of the three criteria for high-quality results in business research, reliability and validity, are met (Bell et al., 2019, p. 46). The inclusion of the third criterion, replicability, is more complicated, and will be discussed in Section 3.1.1. Reliability emphasizes the importance of stable, repeatable measurements with a high degree of consistency (Bell et al., 2019, p. 46). Therefore, to ensure high reliability, one should be confident that, if remeasured, little or no fluctuation of the obtained results occurs, and that multiple-item measures should be coherent in order to not give incorrect indications (Bell et al., 2019, pp. 172–173). This criteria also covers the inter-rater reliability, which calls for an awareness of the subjective judgment of the investigators, which may compromise the consistency in their decision-making processes Bell et al. (2019, pp. 172–173).

The second criterion, namely validity, mainly revolves around the integrity of conclusions made throughout the research process, and covers multiple concepts in need of consideration when performing a qualitative research study (Bell et al., 2019, pp. 46–48). First and foremost, Bell et al. (2019, p.46) explain that the expression is concerned with the degree to which the intended aspect is being captured, which is highly relevant for ensuring the validity of the study's findings. The external view of validity also questions whether the findings can be generalized beyond the context in which they were discovered, thus generating representative samples (Bell et al., 2019, p. 47). Moreover, Bell et al. (2019, p. 47) express a common concern within business research, namely that produced findings may be limited in their way of covering situations in people's everyday lives (included in the perspective of ecological validity). This may result in a limitation for enabling a real-world understanding if, for example, the natural setting is not taken into account within the processes of a qualitative study. As a consequence, considering the aforementioned aspects is highly recommended by Bell et al. (2019) for reaching high-quality results within business research.

3.1.1 Challenges with Qualitative Research

There are of course challenges and cons of using qualitative data collection methods, one notably being the difficulty of replicating results (Bell et al., 2019, p. 178). Regarding this issue, it is an inherent problem experienced in qualitative research in general because of its comparatively subjective and unstructured nature (Bell et al., 2019, p. 374), often involving personal opinions, emotions, and points of view. To combat this problem, the project has entailed keeping as complete records of all research phases as possible, and has presented these in detail in this report, in line with Bell et al. (2019, p. 365).

Having come to an agreement with Lagercrantz that the assignment was to focus on only three subsidiaries meant that statistical data related to innovation processes and capabilities would have been difficult to procure by means of empirical data collection. This naturally limited the project to use qualitative data collection methods, rather than quantitative, as has already been discussed. However, it also brings up the fact that qualitative research often faces the criticism of being difficult to generalize (Bell et al., 2019, pp. 374–375), as the raw data is so specific and limited to few subjects, and cannot possibly represent a general population. The prospective scope of the application of any results from this project has therefore been limited to the narrowly-defined category of companies described in Chapter 1. Additionally, and perhaps more importantly for generalizability than the delimitation of the scope, is making sure that the theoretical reasoning that stems from the project's analysis phase is of high quality, as supported by Bell et al. (2019, p. 375).

To ensure a high standard of analysis, the investigation of Lagercrantz's subsidiaries has involved meticulously examining their current state (current structure and processes) and the events that brought them to that point, with a corresponding level of depth in the descriptions of these in this report. However, Bell et al. (2019, p. 368) touch upon the idea that in striving towards providing detailed descriptions of the context and events being researched, there is a risk that one becomes too fixated on providing detailed descriptions and thus makes analysis of these situations more difficult. This has therefore been an important detail to keep in mind while documenting the project's research and arriving at a reasonable balance between "rich accounts" (Bell et al., 2019, p. 365) of the context and analyzable data.

3.1.2 Case Studies

To acquire detailed data related to the defined topic of this project, the selected research method has involved a case study of three subsidiaries of Lagercrantz (see Section 1.2.2). The project has hence entailed examining the cases of the three organizations in detail. This method mainly generated data (see Section 3.2.1) through interviews and, to a lesser extent, the review of company documents, thus allowing for in-depth investigations into the issues experienced at the chosen type of company.

The case study approach is widely used within business research (Bell et al., 2019,

p. 63), and has been said to entail a comprehensive analysis and observation of the nature of the case under investigation. However, the outcome of this format relies heavily on the narrative developed by the researchers and making sure to capture situational aspects and the "complexities and contradictions of real life" when presenting the conclusions (Bell et al., 2019, p. 66). This distinctly motivates the use of a case study as a source of data when carrying out a qualitative research strategy.

Because the project has involved analyzing three companies and not just one, it can be categorized as a multiple-case study. This introduced several benefits, the most obvious being that one can compare and contrast the cases to gain more accurate insights and valuable results that can more easily be connected to the appropriate theory (Bell et al., 2019, p. 67). Being that case studies are distinguished by an effort to highlight a specific case's "unique features" (Bell et al., 2019, p. 64), investigating three cases has granted access to a plethora of such "unique features," and thereby a bigger pool of data to analyze. Bell et al. (2019, p. 65) advise researchers to select cases that provide ample opportunity to learn. Having chosen companies with an assortment of various levels of product innovation success, as mentioned in Section 1.2.2, the opportunity to learn from these cases by comparing where their differences lie has granted an abundance of opportunities for learning. Bell et al. (2019, p. 65) argue that case study research design focuses on a "bounded situation" and an "entity with a purpose," which accurately reflects both the qualitative nature of this project and the situation the chosen companies find themselves in, having a goal of success through innovation and needing to carry out (internal) organizational change.

Case studies are not free from being fraught with risk however, with Bell et al. (2019, p. 67) stating that the essence of the case might not become clear until very late in the process of researching. This could lead to difficulties in performing analyses until the project's final stages. These difficulties could potentially be minimized by, from an early stage, continuously comparing empirical case data between each of the cases, as well as with the collected literature. Another risk is that one becomes too stuck on very specific aspects of a case, leading to "overly complex theory" (Bell et al., 2019, p. 67). Thankfully, these issues have shown to be minimal and basing the study on just three cases has made it easier to notice what the important aspects have been, after comparing the results between them.

3.2 Project Process & Phases

The commencement of this project first and foremost included a planning phase to identify research questions, decide on research subjects, and narrow down the scope of the project to what was presented in Chapter 1. Once the preparation work had been completed and a comprehensive literature review had been conducted (resulting in Chapter 2), the main research phase of the project workflow commenced. This main research phase included data collection (as laid out in Section 3.2.1). Lastly, an analysis was conducted, processing the collected data, and discussing, comparing,

and contrasting the theoretical findings from the literature study with the empirical findings from the data collection (described in Section 3.2.2).

The literature study began with trying to achieve Goal #1 brought up in Section 1.5 and led to the creation of a framework that would guide the research and the focus of the interviews. Next, using the literature study and framework as a theoretical base, the data collection focused on achieving Goal #2 (Section 1.5) and answering the first research question stated in Section 1.4. Once the issues present in the firms' innovation processes were identified, the analysis continued in an attempt to answer the second research question (Section 1.4). This analysis, aimed at discussing the issues and finding solutions, resulted in the adjustment of the framework seen in Chapter 2 to something more applicable to established SMEs, ending up with the model presented in Chapter 5, thereby achieving Goal #3 from Section 1.5.

3.2.1 Data Collection

Due to the qualitative nature of the project, the data collection primarily consisted of interviews with company employees, in addition to a limited collection of other types of helpful data from the companies, such as organizational charts and strategy planning documents. These methods aimed to provide the necessary empirical data for making comparisons with the literature, and are described in greater detail below.

One of the main ways to collect data for a qualitative research project is to conduct interviews. It is, however, not the only method, as one could, for example, make direct observations of the situations and subjects instead. Due to the greater time required to observe a company process in action than to interview the involved employees about that process, as well as the travel time and cost associated with visiting all of the chosen subsidiaries, the majority of data collection consisted of interviews. All interviews were conducted either online using Microsoft Teams or over telephone. As a result of this choice, there was of course a risk that it would be more difficult to gain a complete and well-rounded understanding of the context in which the research subjects found themselves in, but due to the difficulty in physically visiting the companies, conducting semi-structured interviews in this format struck a fair balance between being practical and allowing for a high accuracy of results. Moreover, the audio of all interviews was recorded so as to make sure nothing had been missed and to allow for transcription and analysis of the data.

All interviews were conducted with only one interviewee present, so as to avoid them feeling pressured (by colleagues, their boss, etc.) into answering in a certain way when discussing their opinions on the company's innovation work (Bell et al., 2019, p. 479). This proved effective, with many interviewees discussing topics that they said they had not brought up with other colleagues. With that being said, positive group dynamics such as cohesion are an essential part of working in a team (Trimble, 2013; Montes et al., 2005), so focus group interviews were initially intended to be conducted, as they would have been able to provide valuable insights into group interactions (Bell et al., 2019, p. 472) and therefore aid in evaluating

the current state of any innovation team or team-like structure that the company might have had. However, due to the immense difficulty in scheduling interviews with the employees, with rescheduling being frequent, and several even having to cancel completely, those interviews that were conducted were individual.

The choice of interviewee in a research project is absolutely paramount in coming to accurate conclusions. Not hearing opinions and thoughts from a diverse array of employees would have hurt the accuracy of this project's results. For example, if a company's "Head of R&D" had been the only person interviewed regarding the development of new products, and that employee had had a view biased positively towards the company's ability to implement new solutions, then certain issues concerning that process may easily have been missed, thus leading to inaccurate results and conclusions. For this reason, purposive sampling was used to determine the best person to speak to, both through a blend of theoretical sampling (Bell et al., 2019, p. 391) and snowball sampling (Bell et al., 2019, p. 395). The former was used to make sure that all areas discussed in the literature review were touched on to some degree, and the latter was useful due to the lists of employees and their contact information had not been provided up-front, which created the necessity to allow the interviewees to recommend other employees involved in the innovation process.

To gain an understanding of the sub-processes and activities involved in the product innovation process, all interviews were semi-structured, allowing the interviewees to reflect on the events and changes they had experienced (Bell et al., 2019, pp. 368–369), while also allowing for cross-case comparability (Bell et al., 2019, p. 438) between the chosen companies. Simply asking rigid, predetermined questions would not have allowed the participants to elaborate on the processes, which were expected (and shown) to be complex and highly affected by the social dynamics within the companies.

It was decided, in collaboration with Lagercrantz, that the data collection would involve between two and six interviews per company, implying a total interview count of six to eighteen. In the end, fifteen interviews were conducted, with an *average* of five per company. In general, they were held at about an hour, but the shortest interview was just under half an hour and the longest almost one hour and fifteen minutes. The interviewee's willingness to expand on their answers and discuss issues related to their work was the key driver in this variation in duration. Using the framework procured during the literature study as a guide to which topics to ask about, the discussions focused on both defining and mapping how each subsidiary's product innovation process is conducted at the moment, understanding their history regarding innovation, but also discussing more general aspects regarding their operations and issues that affect their current work processes. A table with more information about these interviews, including the interviewees' company positions, is included in Table 3.1.

Company	Position	Date	Duration
A	Product Manager	2022-03-04	47 min
A	Sales Director	2022-03-14	60 min
A	Director of Supply Chain	2022-03-23	56 min
A	Project Manager	2022-03-30	60 min
A	CEO	2022-04-08	59 min
B	CEO	2022-03-09	48 min
B	Salesperson	2022-03-15	30 min
B	Workshop Mechanic	2022-03-24	31 min
B	Installation Technician	2022-03-24	66 min
B	Order Administrator	2022-03-31	50 min
B	Project Manager	2022-04-06	37 min
C	Head of Product Development	2022-03-15	71 min
C	Salesperson	2022-04-06	56 min
C	Factory Manager	2022-04-14	43 min
C	Operations Manager	2022-04-28	57 min

Table 3.1: Table of interviews, showing company, interviewee position, date, and duration

Taking advantage of the freedom afforded by the qualitative, semi-structured interview format, each interview was adapted to best suit the interviewee in guiding them towards revealing the hitherto unclear areas surrounding the evaluation of their company's innovation capabilities. In other words, the questions asked during each interview were adjusted to get a better understanding of their role in, and their knowledge of, the company's internal innovation system. To aid in guiding each discussion, an "interview template" was used, whose topics and questions were used as a basis for the discussion with each interviewee. However, oftentimes an interviewee would speak freely about a topic, answering a range of questions, partially or fully, in one go. At other times, questions not included in the interview template were asked, as deemed relevant during the discussion. The interview template's questions served as a fallback whenever the conversational nature of the discussion would cease. Due to the thus varied nature of each interview's questions, it would be impractical to display them all in this report. Instead, one of the interview templates whose topics and questions are relatively representative of the entirety is included in Appendix A.

In general, the interviewing process went well. The vast majority of interviewees were pleased with the questions asked and topics discussed, with many expressing a desire to partake in the final presentation or read the final report. As mentioned above, initiating and maintaining contact with certain prospective interviewees was difficult. This was mainly attributed to their high workloads, but also, in one case, the resignation of an employee. The method of choosing employees to interview described above was followed and the range of employees seen in Table 3.1 was deemed sufficient for giving a well-rounded and comprehensive account of the com-

panies' processes. It would, however, have been valuable to interview developers in Company A and factory employees in Company C, in the same way as the Workshop Mechanic at Company B had been interviewed. The inclusion of Company B's Workshop Mechanic gave the project a full scope of viewpoints from the "top-level" executive management, to the "bottom-level, ground personnel" at this company.

Aside from conducting interviews, receiving and handling company material is a valuable source of data. Bell et al. (2019, p. 503) describe that "public documents are a source of a great deal of information for business researchers." Following this, public documents such as Lagercrantz's subsidiaries' websites and annual reports were read in the early phases of data collection, partly for becoming familiar with the companies before speaking to them, but also for collecting the necessary data related to what types of innovation processes may be appropriate for these companies, taking into account their specific products or services, as well as evaluating how well they are doing financially, which softly indicated their current level of innovation capability. After having spoken to the companies for the first time, access to organizational documents was gained, specifically organizational charts and some strategy and planning documents. Based on the ideas put forward by Bell et al. (2019, p. 505) regarding the use of company documents in case studies, going through these allowed for a better understanding of the subsidiaries' current innovation-related activities and created a basis for further investigation through interviews, and subsequently more suitable and precise recommendations for each company.

3.2.2 Analysis

After conducting an interview, in which both group members were always present, the phase of processing and analysis would begin, which first involved the interview being listened to again and transcribed by one group member. This took extensive time and effort, but paid off in the next step, which involved commenting. Each interview transcript was commented on by both group members individually in an effort to cover all relevant pieces of information discussed. The purpose of these comments was to summarize the data points pertaining to the companies (the empirical findings; see Chapter 4) and highlight issues faced by the companies (the analysis; see Chapter 5). The former type of comment served as a type of coding, similar to that described by Bell et al. (2019, p. 531), giving an overview of what themes had been touched upon during each interview. The latter type of comment drew connections between these topics/themes and the literature and theory discussed in Chapter 2. All these comments were then discussed, one by one, by both group members together, and entered into documents which would serve as the rough, unorganized drafts to Chapters 4 and 5 found in this report.

3.2.3 Coming to Conclusions & Presenting Results

After performing and documenting the project's various analyses, the results were summed up and presented in an effective format to answer the research questions.

The project results and conclusions were to be presented for Chalmers University of Technology, thereby fulfilling the aim presented in Section 1.4. Specifically, the project provides an account, on a theoretical level, of how established SMEs should work with innovation and what such companies should have in mind when trying to improve their processes with the end goal of improving their innovation capabilities. These theoretical insights and conclusions are detailed in this report, to be published by the university, and presented orally at an event for other students, teachers, and examiners to attend.

4

Empirical Findings

This chapter details the empirical, qualitative data collected from the interviews conducted with employees at the chosen three established SMEs (see Table 3.1). Important for the reader to note is that the sections in this chapter are not divided into the same categories as the framework used in Chapter 2. That categorization, and any other connections to the conceptual framework, will be made in Chapter 5, as this chapter (Chapter 4) is solely here to present the direct, objective findings that will serve as a background for analysis and discussion in the following chapter.

4.1 Internal Organizational Factors

First, the internal elements of the companies will be described to allow for a greater understanding of how they work and what they do, starting with their organizational structures. Next, internal company processes will be detailed, followed by how employees communicate and collaborate with each other in the firms. Then the three companies' organizational cultures will be described, as that was a factor found in Chapter 2 to have great bearing on the effectiveness of innovation efforts. Lastly, the systems that the companies use to manage their work and projects will be detailed.

4.1.1 Organizational Structure

The organizational structure of Company C is mainly divided between the companies two office locations: the head office in one country, and the factory in another. Within the head office, all activities except the production and purchasing is being performed, thus, with about one third of the number of employees working abroad at the factory. Both offices were explained to work quite separate, where one employee exemplified the structure by stating that the factory, in simple words, offers a production service to the head office (mainly to the sales department). Continued, looking at the intra-department structure, the factory is divided by product while multiple departments within the head office (for example sales) is structured geographically. The installation team (also referred to as operations) consists of a mixture of both internal and subcontracted technicians, whereas the latter is around four times as many compared to the former. As not being able to guarantee any

work for all technicians, due to an uncertainty in projects at hand, this division was explained to increase the availability of workforce while, simultaneously, facilitate logistics and enable the composition of teams based on previous experience and area of expertise.

When asked about the organizational structure of Company A, the organization verified to be divided into three main departments focusing on sales, supply chain, and products (also considered the R&D department). The employee distribution between each department is almost aligned, with the exception of a few more employees within the product department. Furthermore, similar to Company C, Company A's sales team is geographically based, explicitly leveraging local market knowledge. Additionally, one outlined dimension is the placement of product assembly, present within the supply chain department at Company A.

Crossing over to Company B, a more function-based structured can be identified mainly consisting of sales, service/aftermarket, workshop, and installation, all located within the same building (office on the upper floor and workshop on the bottom floor). The workshop is divided into two main areas producing separate parts of the product line. Continued, the installation part consists of two appointed teams of installers, supervised by two managers within the workshop and one separate manager respectively. Apart from these, there are also one finance department and warehouse department present within the organization.

Additionally, viewing the significance of these various structures, they all turned out to have different consequences as well as impact on the organizations. Naturally, the R&D department at Company C, consisting of one employee (previously two people), clearly has been affected by a heavier workload and decreased ability to perform various innovation efforts than Company A and B. Instead of being able to split tasks within a team, the R&D manager has embraced a broad role including the governance of current product portfolio, while simultaneously trying to develop the company through new innovative solutions. Consequently, external consultants have recurrently been hired to provide expertise within specific subjects, not present internally, to support new product development. Nevertheless, by being one of the first employees at the company, other employees turn to the R&D manager with all types of questions as a consequence of the broad involvement in almost all parts of the organization. Besides the previously mentioned engrossment, the R&D manager also performs tech support and sales work, making it one of the most complex roles at the company. However, this broadness in area of responsibility and general involvement in various departments has shown to be present at several levels within the organization, although it is most evident within the roles of managers. Company C's managers explicitly stated that they are expected to have dynamic capabilities themselves, in terms of taking on many responsibilities reaching outside of their original line of duties, thus, be being flexible. Yet, one of the managers at Company C does not seem to realize how broad roles and wide responsibilities the other managers have due to the large number of own appointed tasks. Supposedly, this arrangement was expressed to be done both intentional and unintentional as

a result of few employees and the desire to leverage specific individuals' knowledge and visions throughout the organization. Consequently, almost all employees at Company C described the organization to be characterized by a flexibility, where well-performing individuals are being handed an increased number of responsibilities (not necessarily wished for).

In the case of Company A, the employees were explained to have broad roles in the sense of wide range of responsibility. However, these responsibilities showed to be tied to a specific area rather than being cross-functional as in the case of Company C. This was described to contribute to a higher degree of knowledgeable individuals as well as teams, specified within one area of expertise. This was exemplified within the R&D department where the diversification of engineers was explained to increase the team complexity. On the other hand, when asked to describe their role, managers within the company did not seem to follow the same principle. Instead, multiple managers could not clearly define their own role and alternatively described various tasks performed. Related to this subject, managers also turned out to have an increased likelihood of performing certain tasks based on previous experience rather than transferring these tasks to the corresponding department, which thus would have allowed them to stay focused on defined area of responsibility. The product manager, in particular, stood out and was repeatedly describes by stating "no person knows everything, except [the product manager]," showcasing the broadness of certain roles within the company.

Generally, the roles at Company B were described to be neither formally set nor strictly enforced. The workshop employees and the installers illustrated a somewhat more defined and rigid set of responsibilities while the managers, similar to Company A, followed specified roles but with a larger number of appointed tasks reaching outside of their main area of responsibility. This structure was not necessarily recalled as dysfunctional but has clearly contributed to a level of confusion and ambiguity around the company hierarchy and the internal knowledge distribution (for example, creating questions like "who is my boss?," and "who performs the various tasks?" in the employees' minds). Company B also attempted to make their roles more narrow, but with employees leaving, the remaining ones were stuck with broad responsibilities again. One more recently recruited manager further manifests the gradually increasing numbers of tasks performed within certain roles. Initially, a relatively strict set of responsibilities was assigned to the manager, but this set has progressively expanded to decrease the workload of others.

Looking beyond the *internal* structure of the companies, outsourcing work is a topic that differs vastly between the three firms. Company B essentially does almost no R&D work at all, and the product development it does perform is done directly by its workshop employees. In comparison, Company A performs the majority of its development in-house, having built up a dedicated team, describes as complex with various types of engineers, over the years. However, the company do outsource certain areas of work to other companies that are experts in those fields that Company A feels it would not be worth it to invest directly in. Company C, on the other

hand, does, as previously described, essentially outsources all true R&D: when a great, new product idea to develop is decided upon at the company, an expert in that area is being hired for a number of months, just to develop the new product, of which the internal, interviewed Head of Product Development oversees and regulating this process.

As mentioned earlier, Company C partners with experts for the latest scientific knowledge when developing new products. However, they usually just rely on one specific expert for this work, which the Head of Product Development realized was a risk during the interview. In the past, Company C took in a student to do research on a technology central to their business. Several of the interviewed managers expressed that bringing in students for development purposes like this would be beneficial, both at the head office and the factory location, but is not done at the moment. The company's installation team relies on a majority of the technicians being external consultants (the purpose being to easily regulate workload, as months may go by between large projects, at which point many technicians may be required at the same time). These external installation technicians are free to choose if they want to go on an installation trip, so Company C's Operations Manager spends time trying to motivate them to take part.

Besides the designated R&D team, Company A also encourages students from a nearby university to perform thesis work and pursue employment at the company within the development team. These students bring with them new knowledge to the company, as well as access to useful tools and university laboratories that Company A is able to use for its product development. On the contrary, Company B is certainly the odd one out when it comes to the three companies' external collaboration. The company do not bring in university students, despite being located relatively close to some universities. They did, however, put forth a desire to increase this type of collaboration, where the Factory Manager explicitly wished for student to join the firm throughout various seasons to help with both organizational and product innovation. The Factory Manager stated that such a source of expertise certainly would, not only bring in new ideas, but also encourage other employees to innovate and gain new perspectives on already ongoing operations, thus, counteract the risk of employees getting blind for new ways of doing things after being within the company for several years.

4.1.2 Internal Processes

At all three companies, the various types of processes and general ways of performing everyday operations were identified during the interviews, and are discussed in this section.

Of the three companies, Company A has comparatively structured processes and responsibility designations when it comes to handling customer orders or developing new products. Essentially, the departments handle their responsibilities in a logical way, and conduct communications with the other departments in a coherent man-

ner, albeit slightly hierarchical and indirect, most often relying on the department managers to relay important information around the firm.

The new Operations Manager at Company B has taken large steps to make the product installation process more thorough, as well as creating a safe environment for employees to bring up issues, which has been a big challenge at the company for years. When the manager started there was no documentation for their work process, so they essentially had to learn everything from scratch. This forced them to personally implement their own system for documenting the processes they engage in, which will also make it easier if a future employee were to take over their tasks. Directly connected to the Operations Manager's work is the installation process. The installers are on the road for a long time and only visit the company office once or twice a week, so communication between the team and the office is not maximized. This is made further problematic by the fact that there is a different team responsible for starting up the system at the client location, some time after the Operations Manager's installation team has put the system in place. In essence, the installation team has to make sure everything is in order for the next team when they get there, without having a clear system for communication with them.

The urgency of delivering on time has also shown to vary between the companies, thus affecting their internal processes in different ways. The window of delivery for Company C has been explained to a large extent to depend on the circumstances present at the customer, and thereby require the organization to adapt to sudden changes. This needed flexibility is also identified at Company B where custom orders create a necessity to produce on-demand where the long and comprehensive delivery process affects the whole organization. At Company A, the delivery time is said to not be as urgent where deadlines only affect smaller parts of the organization (mainly the Supply Chain department) compared to the remaining cases. However, the different departments of Company A were described as highly dependent on one another, meaning that delays in one end clearly affect the other end. Innovation efforts at Company A also become less of a priority when issues with current products spring up, as the R&D department is the one that must handle both tasks.

Another dimension identified to affect the internal processes is the level of manager involvement in overall activities performed throughout the organizations, and to what degree micro-management is performed. In essence, Company A's CEO does not endorse micro-management, explaining that a small disturbance can cause a huge stop in an employee's workflow. There was, however, a large difference between Company A's Supply Chain Manager and its R&D Project Manager, with the former not being nearly as involved in the lower-level of the teams area of work, only supervising the department's work, as the latter, who is involved concretely in the work of the employees, not micro-managing them, but rather being interested and engaged. The R&D Project Manager keeps track of the employees' workloads and listens to them and their hopes in life, not just the work they do, stating that the goal is "to be [their] trainer," not just boss them around, which was explained to significantly improve the team spirit and their overall performance. The Operations

Manager at Company B is further a clear example of an employee at the company who is driven and eager to learn, communicate, and be present within the team. This was described to be achieved by always helping the coworkers if needed, motivating them, and giving them clear feedback and praise on their work, even though the Operations Manager rarely gets to meet them face-to-face. Consequently, the manager was described to be proactive in enabling an open, positive culture in the Operations team. Similar behavior was identified at Company C too, as the Factory Manager does not micro-manage either, and instead delegates responsibilities clearly to the employees.

All three companies have certain processes that are highly individualized, meaning that they are not set, computer system-aided, rule-based processes, but are rather designed in an ad hoc-manner by members of the organization. For example, the Order Administrator at Company B designed a largely "custom" system for the work they have to deliver to other employees, which they have tried to document as well as possible. The individualized working environment (further described in Section 4.1.3) has affected this system and other processes at Company B immensely. Employees tend to transfer knowledge and information person-to-person (partly through the semi-digital system that will be described in Section 4.1.5) as a substitute for not having structured communication processes or discussion meetings, causing the departments to work very independently. This was also reflected in the shared understanding of the various roles at the company. Multiple interviewees expressed an inadequacy regarding knowledge about the distribution of tasks and responsibilities between different roles inside the organization, initiating further detours when trying to locate the right person to talk to. Continuing on the topic of individualized processes, the Operations Managers at Company B and C both designed their own, personal systems for the work they do and have tried to document them as well as possible, with the difference between them and company B's Order Administrator being that the Operations Managers are more aware of the need to improve their systems than the Order Administrator is.

To create a better understanding of these internal processes, this section will conclude with a description of Company C's Operations Manager's workflow in the context of how it fits into the rest of the organization's internal processes.

The process starts with Sales closing a deal with the client. After agreeing on the extent of the client's responsibility in the installation (whether or not the client will be the one to provide installation technicians), Sales contacts Operations. Next, the Operations Manager contacts the client, asking specific questions about the site in order to better plan which combination of the dozens of installation technicians should be sent. The manager therefore needs to be well-versed in their team members' capabilities and make it appealing for them to travel to these often-remote sites. Simultaneously, the R&D department also has to check with the client of every delivery, or at least with Sales, to verify if anything needs to be changed with the order, because the products usually have to be adjusted to fit the client's site. After this, a so-called "pre-briefing" meeting is held, including R&D, Sales,

and Operations. This is meant to be used to inform Operations about the specific changes to a project that were discovered by R&D to be necessary. Despite this, the Operations Manager is still responsible for arranging the meeting and asking the right questions regarding product changes, mentioning that is is easy to forget to ask certain questions when there is no good system for storing information.

This entire pre-installation process is ridden with the use of multiple different computer systems for storing various pieces of information, and much of it only exists in disparate email chains (which the Operations Manager is forced to search through to get the needed information to perform an installation successfully). Once the Operations Manager has collected all the information, they will store everything in one, comprehensive email chain, which they call the "briefing emails." This was said to include information such as the "work scope, client specifics, schedules, tools, products, contact person information," and "lots of attachment files, like layout pictures, part lists sent to the client, covid rules that the client has, packing lists, and special work instructions." This "briefing email" is sent to R&D, Sales, and Operations for storage.

After collecting the necessary information, the Operations Manager has a project briefing meeting with the installation technicians through an online video-call to make sure everyone is in agreement on how the installation is to be carried out. When the technicians arrive at the customer site, they will often takes photos (with the client's permission) and document the site and the installation process at the Head of Product Development's request (who wanted more specific information about the customer sites to guide the company's NPD efforts). In addition to this, the technicians also fill out a debriefing document for internal use including comments about how the installation went. They use the debriefing document to review their work with the entire Operations team and manager. R&D and Sales used to take part in these meetings but gave up recently, citing a lack of time as the reason. As a consequence, the Operations Manager has to actively reach out to them to deliver the information that they might find useful.

4.1.3 Internal Communication & Collaboration

When asked about the internal communication and collaboration, both established and predetermined attendances as well as more spontaneous and open opportunities for conversations were considered. These dimensions turned out to be affected by not only physical distance, but also the internal systems, processes, and culture present at the various companies.

Looking at Company C, the geographical distance between firm's various offices has naturally contributed to fewer in-person meetings, by which communication between the two is instead maintained through online meetings. The Factory Manager explained that meetings between both parties are held daily but that the corresponding department at the head office varies. Quarterly meetings have also been established where the company's strategy and future are being discussed. The business-related

communication was thus expressed as well-functioning, but the Factory Manager expressed a difficulty in creating a consistent culture between the two parties due to the inadequate in-person contact.

Continued, the internal communication within the factory was described to be characterized by an openness, both within and between different teams, while individual meetings between mangers and all team members are used to build trust and maintain a good relationship. During these meetings, employees were described as able to raise issues or thoughts, contributing to a better working environment where continuous improvements are being realized. A similar relationship was identified within the operations team at the head office. Generally, the team was described as loosely coupled to the rest of the organization, partly due to the structure of the company as well as the limited gatherings between technicians and the rest of the organization, but when joining the firm, the Operations Manager did a vigorous attempt to increase the team spirit. By having a positive outlook on employees being allowed to learn, and, with team-building not being set up beforehand, the Operation Manager took the initiative to engage with and learn about all team members. This was described to enhance the trust between the two parties, allowing for an increased dialog and collaboration. Furthermore, the overall communication within the operations team, as well as between them and the remaining departments at the firm, was confirmed to, almost without exception, be realized through WhatsApp. This approach was described as well-functioning but put a higher pressure on the Operations Manager to maintain a role as a middleman, passing relevant information from the technicians to, for example, the R&D department.

It was further discovered when viewing Company B that the intra-firm communication differs between the various departments. The more spontaneous communication was described as limited to each of the two different floors within the building, partly as a result of no natural cross-floor physical encounters. The various department were even described to, for example, eat lunch or take a break separately and thereby only visit other departments when something work-related needs to be done quickly. Consequently, the employees tend to stick to their original group of people in which they feel comfortable rather than putting the effort in to get to know everyone within the organization. The employees did however express an awareness of everyone within the organization, but the knowledge of each area of responsibility and its corresponding tasks was more unclear. For example, as certain employees have different working hours compared to others (they may start to work early and leave early), and because they do not communicate with the other employees about what they have been doing (or vice versa), the other employees get jealous, not knowing whether their going home early was justified. This uncertainty was further recalled as creating longer lines of communication within the firm while searching for various types of information or person in charge.

Additionally, communication and collaboration in a general matter was explained to have improved significantly when the new CEO was appointed a few years ago. Currently, monthly meeting is being held where the CEO informs the employees

about future happenings, goals of the firms, along with updating them on current matters. All employees, however, are not able to participate during these occasions, especially the installers, as a result of them being out on customer site. Thus, employees at various levels within the organization did view their relationship with the CEO as familiar, allowing them to raise various thoughts, opinions, or ideas directly without any prescheduled meeting. Despite this, the communication between certain members of the management team and other, "lower levels" of the organization was described as poor. The Sales Manager at Company B does not communicate much with the workshop employees and does not see the value in doing so, and multiple employees choose to transfer information through middle managers instead of using direct communication towards the management team. Accordingly, the data gathered during the interviews points to that the information flow from the management team to the "floor" (but especially communication between the managers) at Company B is much higher than the other way around. For example, the managers discuss problems and questions with each other every month and then send the key points out to the rest of the organization, but information or suggestions is rarely discussed with the management team or between the two levels of the organization if not requested. For example, the Order Administrator did not feel it would be appropriate to bring up own improvement suggestions with the CEO with respect to the amount of work already placed on the managements' desks.

Related to the internal communication, it was further evident that because employees lower down in the organizational structure of Company B do not have customer contact, they do not understand the company's overall vision and goals, and do not feel a strong sense of connection and responsibility towards the customer. They were thereby described to lack "the bigger picture." In other words, employees may know what they are working on, but not the overall, long-term purpose for which they are working or what their contributions mean for the company's future. It was further emphasized that a clearer dialogue from the management team to the lower levels would be beneficial for the creation of a clear picture of the value created towards the customer, thus, increase the motivation for employees to perform a good job.

Continued, Company A, on the other hand, have a series of different meetings set up to generate a good dialogue between the various departments. Firstly, company-wide meetings are being performed where all employees are encouraged to share information, thoughts, opinions, and ideas. These occasions were stated as crucial, especially when referring to innovation, since each department contribute with different perspectives, thus, leveraging knowledge sharing. In addition, cross-functional meetings are performed, usually every weak, to keep everyone updated, discuss current project and tasks, share information, and generally improve their overall operations. For example, the R&D department participates in the SCM meetings as well as in the Tech Support meetings, while internally having daily stand-ups to increase the communication, support, and teamwork within the team. The Project Manager further recall that manager meetings are being held in which company goals are followed up on continuously. The management team at Company A additionally gathers employees' opinions and feelings about company-related matters a few times

per year through online forms and each manager has occasional development talks with their employees.

Besides the internal communication, the actual collaboration between department turned out to significantly vary in both frequency and quality within the three companies. Company B described a quite high cohesion between the various manager while there were no to little collaboration between the different departments. Exemplified, even if the work of the Project Manager and the managers within the workshop clearly were described as coherent and interdependent, both parties noted any collaboration as non-existing. This was later clarified to mainly be an effect of other organizational characteristics since this type of cooperation is not required by the various departments. Instead, the main coordination between the various departments is carried out by the Order Administrator and the Sales Manager who ensures that each department has the necessary or requested information. The Project Manager further illustrated that this lack of collaboration within the firm has contributed to the previously mentioned uncertainty regarding each other's roles. When joining the firm, the Project Manager was not, to a sufficiently large extent, introduced to the other departments at company, and with lacking collaboration and spontaneous communication, no clear sense of community has appeared later on. Continued, when asked about what an increased collaboration would imply, the Workshop Mechanic stated that multiple departments certainly would benefit from an extended knowledge transfer. Clear examples were described where certain types of information, certainly available somewhere within the company, would make their own work easier if they were to have systems to transfer that knowledge.

Company A did, however, explain a similar issue such as the one experienced by Company B. Despite the expressed well-functioning internal communication, a slight ambiguity regarding the work performed by each department has been shown to create some frustration throughout the organization in certain cases. For example, as each department have different interests, postponed activities can form a level of irritation. According to the Project Manager, similar scenarios could thereby benefit from an increased common purpose and a higher degree of mutual understanding to minimize such emotions between departments. Accordingly, some boarders still exist within the organization, but activities to improving the collaboration were described to actively be initiated, whereas the Project Manager expressed a desire to be a part of this ongoing change after viewing the effects of such improvements within the R&D team.

4.1.4 Company Culture

By talking to all the companies, it became evident that the internal culture, to a large extent, affects all activities performed within the firm, as well as the general feeling of, and view on, being a part of the company experienced by the employees. To monitor how employees generally feel and how the company can create a better internal environment, Company A conducts an employee survey three times a year. Based on this survey improvements are being implemented in an attempt to

higher the score each year and is, at the same time, seen as an advantageous way to be able to collect opinions and thoughts from each individual working at the firm, separate from other recurring dialogues performed. In a comparison of all three companies, the culture also turned out to be most positively experienced by employees at Company A. The culture was described as enabling both open and honest conversations, and a good team spirit, while being characterized by encouragement and appreciation. Most interviewees explained that employees are appreciated "only" for performing their assigned tasks and thus did not have to go the extra mile to feel like an important and contributing part of the organization. The Project Manager further recalled that they, within the R&D team, prioritized convivial dialogue, trust, and equality, as well as each individual's own vision, goals, and hopes. In addition to this, the joint coffee breaks, scheduled every day at 9 a.m. and 2 p.m., were also described as an appreciated action taken by the company. These occasions were described as something sacred within the company, during which no meetings were to be booked, instead encouraging employees to talk to and get to know one another. Directly opposing the statement on the "sacred coffee break" schedule was the fact that one of the interviews was held at exactly 2 p.m., decreasing the credibility of these claims.

Company B's culture differs greatly from that of Company A. While all interviewees were adamant about their trust in their coworkers, and when asked about the "openness" of the culture, most employees at Company B described it as very open with good teamwork, what was actually discovered was that this "open communication" was with a very small set of people. In other words, it is more of a closed culture than described. Employees seemed to have clear "friends" or be part of "cliques," within which communication is open, frequent, and informal, but outside of which there exists almost no communication or knowledge of the other employees' tasks. A related problem brought up by one team was that the rest of the organization does not find out about what the team does *unless something goes wrong*, at which point "everyone knows" who was involved. Because of these issues, the organizational-level "team spirit" is quite low. Not only does the production team have coffee breaks separately from the office workers, but the two installation-related teams spend most of their time traveling, and hardly get the chance to meet their colleagues at the office/workshop. Although team activities are still quite rare at Company B, the new CEO was said to have made a significant change regarding this, recently taking the whole company out on a team-building trip. The CEO has also caused the employees to feel more comfortable in their work environment. Additionally, the employees described how they value experience highly (and rely on the people that they know do their job well), but at the same time, they were described as not showing and receiving enough appreciation. Appreciation would generally only come in the form of short comments such as "good job," and this would only happen after something exceptional was done. One manager even said that the lack of appreciation shown might be due to the fear of higher requirements such as salary being demanded by those who perform well. This reflects the general mindset and focus on money in all these companies.

Just like in Company B, the employees of Company C truly value people who take high levels of initiative, but unlike Company B, they show their appreciation much more openly and vocally. A their office location, their family history has affected their culture significantly, with "everybody knowing everybody and their strengths and weaknesses." This has caused tensions between the people at the company who care about quality and take initiative and those who do not (affecting the turnover rate discussed in Section 4.3.2). The culture additionally dictates that employees should be respectful, professional, and willing to contribute. The culture in the head office, however, is very separate from the culture at the factory and in the installation team. Within the installation team, there is a good team spirit, with the Operations Manager truly working hard to motivate the team. This goes for the Factory Manager as well, implementing concrete reward systems to encourage the factory workers to continue doing a good job. However, these teams (and especially not the sub-contracted installation technicians) are hardly recognized by the head office, leading to a closed culture "between" the employees of these groups (although their managers do communicate frequently).

One of Company C's managers described the general management style there as judgmental and blaming, and explained a serious issue at the company: that if an employee brings up a problem to the some members of the management, then they act as if it is the employee's problem, causing employees to be uncomfortable with the management and not bring up important issues experienced. The manager trusts their employees, but cannot act as the "middleman" for them, because, they said, it is difficult to discuss a problem without mentioning who experienced it (which might lead to them getting in trouble). On the topic of "middlemen," Company B also experiences long lines of communication. A clear example being that of the Workshop Mechanic interviewed, who acts as a link between the management team and their own team members. Although the team members state that they feel comfortable going directly to the CEO with issues, it seems they rarely do, and go to the aforementioned Workshop Mechanic instead, who relays messages to the management team.

Another dimension describes as cultural related is the interaction between, and integration of, newly hired employees and those who have been working within the organization for a longer period of time. At Company A, an awareness was shown towards that these, somewhat separate, groups of people have different needs and perspectives, meaning that both parties' approaches need to be actively taken into account within the organization. As a result, efforts are being taken to share knowledge across this boundary. The CEO exemplified this matter by confirming that they within the management team, consisting of multiple experienced employees, have created a rule of not saying no to things at first glance, regardless of whether, for example, the same idea put forth by an employee has been tested before without giving any results. The management team were instead encourage to always respond with a positive attitude, taking the perspectives of both "newer" and "older" employees into consideration. It was further emphasized that "older" people think in certain ways which usually makes them efficient, but that it simultaneously does

decrease the propensity for new ideas to arise. On the contrary, "newer" employees were explained to seek advice on, for example, new ideas from managers with more experience.

Company B on the other hand did not express the same type of realization for this "issue", and were instead viewed as somewhat resistant towards integrating "newer" people within the organization. Multiple employees did express the company culture as welcoming to new people, but the same individuals repeatedly pinpointed that, especially younger employees, were less good at performing their tasks and in need of more training. The Order Administrator further described a tendency of only socializing with the "older" employees, directly a result of them having worked together for a longer period of time, and the Order Administrator thus did not show any desire to interact with the more newly hired employees. This was confirmed by the project manager who, after arriving at the company, did not experience any warm welcome or strong sense of community within neither the team of managers, nor from other departments.

4.1.5 Internal Process Management Systems

The variance in workload has clearly shown to be dependent on multiple dimensions while, simultaneously, affecting the companies' general line of work. Generally, all three companies express that the main reason for not performing certain tasks or developing internal processes and systems with the intention to cultivate innovation, is the lack of time (and resources). In detail, the workload of Company C can, in certain periods of time, be experienced as overwhelming, causing stressful situations in which a form of isolation occurs among the employees. Although similar situations can be discerned in Company B, the workload distribution tend to be more dependent on department and area of responsibility, whereas one manager, for example, appreciated unexpected tasks in addition to the remaining chores to increase the pace of work.

Despite the uttered preoccupation at the aforementioned companies, Company A demonstrate a noticeable difference where systems for managing workload and areas of responsibility have been implemented. This has shown to minimize the likelihood of sudden interruptions in work which, primarily within the R&D team, previously created problematic situations where current tasks had to be postponed to prioritize unanticipated cases. A comparable scenario appeared to recurrently present itself at Company B, in which the whole organization pause and dedicate all their work to solve an emerging issue. Accordingly, these equivalent situations were explicitly described to minimize the ability to designate workforce to various innovation efforts.

Additionally, implementing systems to manage the workload and divide tasks within a team has shown to allow for dynamic working processes, expressed as favorable for streamlining efficiency. In the case of Company A, the gradual change towards these types of systems (for example Scrum) was confirmed to not only reduce stress and simplify the settlement of emerging issues, but also grant agility, extricate time

for other initiatives, and increase the internal communication. According to Company C, the accelerated flexibility in the case of Company A was described as an organizational necessity, allowing for employees to take on tasks separate from their original line of duties.

When asked about internal systems all three companies could identify systems that in some ways are being used to manage their everyday work processes, however, the efficiency of these were expressed to vary highly. At Company B, the overall method for exchanging information between departments is being managed through a semi-digital system. This system is mainly organized by one manager who collects customer orders from sales, double-checks the given information and confirms its logistics (for example components in stock and possible delivery date), and then compiles a physical folder that is handed over to production weeks prior to the delivery. The information is also being stored in an ERP system that was switched several years ago, which was considered difficult because of a lack of time employees were able to dedicate to the switch. This ended in data being moved over in a crude manner, and the printing of physical folders was explained to simplify the shared understanding of the given information as a result of employees not being used to the digital system. Additionally, the system was expressed to highly affect the flow of communication within the firm, which is exemplified by all arising questions related to, for example, a specific order ended up at the aforementioned manager's desk. Complications regarding this system could also be identified at the handover of information from the teams of technicians whom, after completing for example an installation on site were to fill in information in the binder for the sales department to add into the ERP system. This approach proved to include difficulties with regards to the translation of specified information given by the technicians as it was not always clear or thoroughly written. However, an improvement regarding the latter perceived problem were explained to be implemented shortly, including tablets on which the technicians in a similar and readable way should fill in the service protocols which then will be sent directly to the office in a digital form, also minimizing the risk of papers being destroyed or forgotten at site.

Looking at Company C, differences in used internal systems were described between the head office and the factory. The Factory Manager confirmed the usage of an ERP system compared to the head office, where the Operations Manager described a comprehensive way of gathering and storing various kinds of information (further described in Section 4.1.2). It was further described that an ERP system had been requested by the manager due to the cumbersome internal processes present within the company, but that no actions were taken by the management team. Instead, the management team proved to consider such a system unnecessary and questioned what employees would do with the time saved if most of the tasks were to be replaced by a system.

In addition, Company A pinpointed the necessity to store information of various kinds and have therefore increased the usage of such systems in recent years. Accordingly, a documentation system where meeting notes and arising issues are being

tracked where explicitly explained to be used between the Supply Chain and R&D department. However, it appeared that the storage of product information may not be sufficiently implemented as the company on multiple occasions realized that information about older products were forgotten and nowhere to be found (not even employees who worked at the company for a long time remembered what had been done before). This was described as a problem, especially within the R&D team who doubtlessly saw the opportunity to use such information within their product innovation processes.

4.2 Market & Industry

This section discussed the industries that the three companies work in, which highly affects what types of innovation they are able to perform. The industry in general is detailed, followed by the companies' relationships with their suppliers, the ways in which they sell to their customers, and lastly, their actual customer relationships.

Although the specific industries in which the three companies conduct business in are extremely different, a characterization of all three is that they are highly regulated, with laws and rules governing business and product specifications to a large extent. This has been seen to be a major source of innovation ideas for the companies. However, there is a major difference seen between the industries of Company A and B: the former being very fast-changing (being a high-tech industry, new technologies are quick to appear on the market) while the latter is slow-changing (it is much more hardware-based, and not many new technologies have affected their solutions over the years).

Interestingly, Company C is unique in that it has an extremely limited potential user base in its home market, and has therefore been forced, since its inception, to look globally for customers. A factor affecting Company C's already-global business is that its factory location is getting more expensive to produce in. The Factory Manager expressed two possible future solutions for this: either to become more efficient, decreasing costs (perhaps by using robots, as hinted by the Factory Manager), or to move production to a cheaper country.

Because of the niche environments these companies operate in, they are all expected by their customers to be experts within their respective fields, and while technological function does not differ significantly among competitors in all three industries, quality is one of the main differentiating factors and selling points for the three companies, with Company B explaining that quality is essential in maintaining the (very small number of) customers' trust. The interviewees, from Company B and C especially, often said that because they work in a very niched industry and company, "outsiders" cannot easily come in and instantly know how to manage business in that context. They discussed this in relation to the difficulty of recruiting new employees and the idea of bringing in external consultants to help them develop better processes.

Company A and B are expanding into new geographical markets. This has revealed some major market differences that the companies have to account for in their operations. In its home market, Company B's customers and competitors are consolidating, but small, new companies do show up occasionally. The two main markets it is entering into are very different from each other: one is like the home market with a handful of "key accounts" it can sell to, while the other involves selling directly to end-customers. Unlike the home market, these markets are extremely price-sensitive.

4.2.1 Supplier Relationship

The companies did not say much about their suppliers, but the Supply Chain Manager at Company A did say that they have a good relationship with mutual trust, and that the suppliers tend to want information about future orders, which puts pressure on Company A to always plan, get approvals, and ship long in advance, also mentioning that the suppliers do provide them with ideas on how to build the next generation of products, including information about parts and processes. Frequent communication and information sharing with suppliers is needed due to global shortages of certain parts that Company A's products use, and also to avoid an issue that the Supply Chain Manager brought up: that the suppliers have a hard time keeping up with the company's product software updates. This volatility on Company A's supply-side is reflected in the entire industry of Company C, with its managers describing it as "volatile" and "unreliable."

4.2.2 Sales Process & Channel

All three companies handle sales in somewhat similar ways, albeit with a few key differences. Being niche technology companies, it is essential in all three cases that the salespeople have an in-depth understanding of the products. They are all somewhat reactive rather than proactive when it comes to gaining customer deals: they have a number of very large customers that come to them regularly to order solutions. For example, Company B only has a couple dozen authorized installation companies it is allowed to sell to.

Company A is likely the most proactive, however, always seeking to push its newest solutions to the installation companies it has to go through, but relying on some long-term major customers for frequent orders. The sales channels of both Company A and B are unique: they are both required to sell to installation companies (in their home market), not just any private enterprise. It is these installation companies that sell complete packages to the end-customer, including, but not limited to, Company A and B's products, respectively.

Company C is the odd one out here: it sells directly to end-customers in most cases and relies largely on the Internet to do so, being an internationally-focused company with customers all around the globe. They used this to justify their passiveness, stating that it would be difficult to search for potential customers and contact them,

and that it is simply easier to respond to customer requests through their website.

The Sales Managers at Company A and B both stressed the importance of providing accurate, calculated quotations to the customer and Company A mentioned the risk of providing prices to end-customers, which would undermine the good relationships Company A has with its installation companies (due to them not wanting the "wholesale price" disclosed).

Company C is the only one that has focused heavily on upselling, and selling in larger batches, in recent years (a direct result of the interviewed Sales Manager entering the company). Company A may occasionally help an end-customer update its existing products if there is an issue, but the installation companies have a lot of power in what initially gets purchased. Company B often tries to convince the customer to purchase additional system parts as part of the initial order.

Despite these differences, the sales process is quite similar at all three companies. A client gets in touch with Sales, receives a quotation, and agrees on ordering the solution. Then, Sales will contact Production, either directly or indirectly, while also discussing with the client about installation responsibility. After that, Sales will contact Operations to get the installation process started.

The companies' aftermarket channels share similarities: they all offer customer support, such as service or testing, directly to end-customers, regardless of how the system was sold in the first place. In all cases, the customer has to be the one to contact the company to get assistance, although Company C does provide regular testing as a service.

4.2.3 Customer Relationship

As previously stated, Companies A and B mainly sell through authorized system installers (or authorized dealers), who are responsible for selling an entire system including Company A and B's products, while Company C usually sells directly to the end-customer (in 70% of cases—the other 30% are brokers or management companies, according to the Head of Product Development). This system means that Company A and B do not have a very close relationship with their end-customers. Company A invites some potential end-customers to seminars, but has not taken any significant action to increase brand recognition of its products or the end-customer's eagerness to use them. Company A's Sales Manager largely dismissed these possible actions, saying that it is difficult to keep track of end-customers and strict contracts prevent the company from bypassing the authorized dealers and going directly to the end-customers. Company B's CEO stated that the end-customers might contact the company 2-3 years after the purchase, asking for service assistance on the products, but other than that, there is no contact.

They are, however, extremely close with their direct customers, having continuous communication and collaboration with them, especially the largest ones, with all

three companies citing this as a selling-point. All three companies have communication with their customers from multiple places within the company. In all cases, Sales will take care of the initial contact and Operations will communicate when performing the installations. Even the Supply Chain department has frequent contact with the customer in Company A. In Company A and B, the CEO has frequent communication and long-term relationships with several customers as well. Company A provides training and education to the sales- and technical employees of its direct customers (the authorized dealers). While this is often sufficient to enable the direct customers to correctly install the products at end-customer locations, the solutions are complex enough that Company A often has to send its Technical Support to the end-customer to assist in an installation. This may also happen when end-customers have to update the products, as they are usually just given written instruction manuals and do not have a good-enough understanding of the systems to do so themselves. The small part of Company B's solutions that the direct customers actually install themselves requires clear instructions, which the company tries to provide, but often feels is not enough, leading to incorrect installations. Company B is currently working on simplifying these manuals and documentation. It is clear that all three companies have issues like this, as even Company C mentioned that customers who opt to perform the installations themselves often lack the full knowledge required, and the company has to send out at least one technician anyway to supervise the process as a result. Company B provides customer installation and system updating as a service, and one of the managers at the company therefore explained that providing customer education would cannibalize the profit from that service.

Company B and C usually send their own teams of installation technicians out to the customer site to set up the solution, while Company A relies on its authorized dealers/system installers to perform this. Company B actually sends two teams for each project, one at the beginning to perform installation work and the other later in the process to put the system into operation. Company B and C's installation personnel usually do not meet the actual buyers of the system, but instead the on-site personnel (for example construction workers, janitors, or technicians of other sorts) who is usually a different (and diverse) set of people. Company C's Head of Product Development occasionally travels to customer sites to join the installation staff and follow the installation process, gaining valuable information and ideas.

In Company C's case, the customer's purchasing department and its personnel working on-site usually do not communicate well, leading Company C to have to keep a constant, friendly relationship with both parties to minimize communication issues during installation. The Operations Manager explained further that because so many of the client's employees are involved in the communication, individual responsibilities at the client get muddled. An example of an issue related to this, according to the Operations Manager, was when an on-site manager requests a certification document from Company C, not knowing that it had already been delivered to his or her own purchasing department.

The lack of adequate communication with external actors affects standard installation processes as well: if the customer has not made sure that everything on the site has been set up correctly for Company B to perform its installation, Company B has to wait, leading to unnecessary costs. Exactly the same problem affects Company C, but because of its customer locations being global, the monetary stakes are often higher in the (relatively common) event of an installation hold-up.

It was evident from the discussions with all managers from Company C that customers in their industry are not very price-sensitive, and that Company C therefore has no issue charging clients for their time when unforeseen changes occur. At the same time, the customers hold a lot of bargaining power and Company C therefore sometimes has to adjust its operations to suit the customer.

The three companies' customer relationship can, in general, be characterized as honest, trusting, transparent (willing to tell the truth even if it is bad news), and loyal. Exemplified, Company A will make sure the customer knows in advance if a delivery is expected to arrive late. For Company B and C, timing is of the essence when it comes to installations, so their Operations Managers often have to have difficult conversations with the customer, telling them that certain work has to be done by them before the companies can come out to the customer location.

Due to the extremely small number of authorized dealers that Company A and B are allowed to sell to, the two companies are extremely reliant on maintaining those relationships. The customer relationships are so close that the CEO of Company A even described receiving hugs from them at a recent exhibition. To double-check this, Company A described that it consults with a third-party organization that talks to its customers to find out what they think of the company, giving the company great, unbiased insights into the relationships.

Because of the rigidity of their industries, both Company B and C explicitly stated that their customers get excited when new solutions enter the market, and are more than willing to collaborate on testing, and give feedback on, product prototypes with them.

4.3 Employee Characteristics

The people in a company and their viewpoints on what the company does and should do in the future obviously have an effect on the company's innovation efforts and plans. This section thereby explains the characteristics of the three interviewed companies' employees, with a focus on the managers. Their backgrounds are described, as well as their perspectives on the companies' existing resources and future resources (in terms of new hires), followed by some comments on their thoughts surrounding ownership by their parent company.

4.3.1 Human Resources

The managers at the three studied companies have various professional and educational backgrounds that affect their work to this day. The CEOs of Company A and Company B are amazingly similar in this respect: they have both been at their respective companies for approximately 25 years, doing a diverse set of roles ranging from sales to more technical engineering jobs, but Company A's CEO worked their way up to their current role within just a few years, while it took much longer for Company B's CEO. The Supply Chain Manager at Company A had also been employed there for about 30 years. Company B's Order Administrator and Workshop Manager both had over a decade of experience in various role related to their current ones. The R&D Project Manager is quite new to Company A but has experience in many different engineering roles and also managed a large organizational change at a previous employer. The Sales Manager at Company B has been in their role as salesperson for many years. While Company C's interviewed sales manager had a different educational background, they too have worked with sales for several years, albeit at various companies (both large organizations and start-ups) internationally. Company C definitely had the most nationally diverse set of employee backgrounds of all three companies, and also the largest number of people having worked at startups, with its Factory Manager having a relevant university degree and start-up background as well (being promoted to their current role very quickly), and The Head of Product Development assisting local start-ups during their university studies. Its CEO, however had previous experience leading a company with hundreds of employees. The Operations Manager at Company C has been there for less than a year but has extensive experience working in a few different sub-fields of their current domain, but at much bigger companies, and stated therefore having experience using "good" processes and systems. Company B's Operations Manager is very similar, also being new to their company and having extensive experience doing various roles vaguely related to their current one, starting with manual labor and working their way up to management positions, even starting their own business.

As seen, all three companies have many employees who have worked at the respective companies for decades, causing them to have a deeply-rooted care for the business, but also deeply-rooted habits and mindsets. Company C even started as a family-owned business and the family members still in the business are extremely central figures in it.

4.3.2 View on Current & Future Resources

Managers at all three companies expressed that their company lacks the necessary resources to pursue new innovations whole-heartedly. The CEO at Company A expressedly stated that a low level of resources is a huge problem for them, but they have managed for several decades without vast resources and are confident that they will manage in the future. Company B's CEO also expressed that they lack the resources needed to be innovative and feel that they cannot pursue innovative work themselves, but rather need external help with this as they currently do not have the time. Company C's Head of Product Development was transparent about

the company's insufficient knowledge in certain fields, and stated a strong desire for increased collaboration with universities and students. Company A displayed an ability to accurately evaluate what knowledge it has and what external resources are needed to fill its knowledge gaps. A major way Company A uses to fills these knowledge gaps is taking in university students with specific technical knowledge. In this way, hiring new employees and working with universities is often viewed by Company A as being a solution to competency problems. Company B was hence the only one that did not mention university students as a potential solution for knowledge and expertise, despite being located not far from several esteemed institutions. The operations manager at Company C agreed with the Head of Product Development, stating that having more employees would alleviate the extremely heavy workloads experienced by all employees currently.

Interestingly, in terms of financial resources, the operations manager at Company C is only given a budget for items and tools directly related to work tasks, and is given nothing for developing "soft skills," i.e. for personal or team-member education or training, or for team-building, but would greatly appreciate this as part of the budget.

Both Company A and Company C look for potential hires who have a "suitable" mindset (with Company C even having applicants fill out a personality survey as part of the recruiting process), want to learn, are motivated and good at teamwork, and have at least basic knowledge and experience of the necessary systems and processes of the role in question, while Company B focuses more on finding individuals with previous experience and expertise for the role, not so much on the person's personality. The employees at both Company B and Company C were clear on the importance of enjoying high variation and responsibility in their work at such small companies. However, both companies also explained that the hiring process is tough due to applicants stating that they have the right skills, but do not actually perform well once they start the job (Company B), or that they cannot handle stress efficiently and adapt to the "fast-moving" roles (Company C). For Company C, this meant that many new employees left the company or were fired after a short time (a near-100% turnover rate at the head office in a span of two years), and this was described by a sales manager as a huge problem and risk for the company. The operations manager was certain that cultural and management problems were the main driver of this turnover rate.

All three companies, being subsidiaries of Lagercrantz, shared some thoughts on the relationship with their parent company. Although they all felt that the relationship is good, there is certainly room for improvement. The CEO of Company A expressed a desire for more knowledge-sharing and idea-sharing across the group, as well as assistance from the parent company-level that could facilitate bulk prices in the supply chain, as several of the group's companies (previously unknowingly) source materials from the same suppliers, so that the subsidiaries would not have to keep contacting each other individually to find out valuable information. The CEO of Company B felt that they have a very good relationship with their contact

people at the parent company, and that they do not feel controlled by them, despite certainly having an increased pressure to deliver better financial results under the parent company's ownership. Company C desired more "room" to use its profits for activities like product development, team-building, and employee education.

4.4 Innovation

This section presents company findings directly connected to how they work with innovation, going through topics of strategy and goals, and how they work with and plan for them. Their products' characteristics are described, followed by some of their development practices and the employees' mindsets on changing, learning, and developing the organization: both product and organizational innovation, if you will. The sources of the companies' innovation ideas, and how they evaluate and manage these ideas, is subsequently detailed. Lastly, some comments are raised on how innovation is supported in the companies.

4.4.1 Vision & Goals

Company A's strategic planning is the most developed of the three companies'. Their customer relationship is the focus for Company A, involving their biggest customers directly in the development of their so-called "roadmaps" during in-person events in which market trends are also discussed. While these roadmaps are certainly clear, mapping areas to work on and goals on a timeline, their strategy is certainly short-term. The managers stated that they plan projects, for example, between one and two years in advance, but there was little indication of where the company is headed and might end up after the time horizon of those two years or so. This is not to say that there are not employees at Company A who think about the long-term, with the CEO having been a partial owner of the company for decades, explaining the CEO's relatively long-term outlook on the company's success, however, this is an exception. In general, the thinking is very short-term at Company B as well, and there is a mindset that issues and ideas have to get handled "here and now," and if they cannot, then they are not worth pursuing. A similar mindset was present at Company C, where quick-to-implement, money-saving ideas get implemented without issue, but longer-term investments get disregarded. This thinking was reflected in their mindset surrounding strategy.

While several of the interviewees at Company C stated that they felt that the company strategy was clear to them, none of them actually described what the strategy was. A sales manager at Company C called the business strategy "flexible," having to adjust to the effects of the coronavirus pandemic and the volatile market. They stated that there was little point in deciding on a fixed strategy when external factors often cause major changes in how the company does business. Company C's Operations Manager explained clearly their understanding of the difference between a plan and a strategy, and while they have been tasked with creating a business plan, no one in the company has expressed a clear strategy, according to the manager. The Operations Manager understands that the company must include the work

environment and culture in its strategy to help improve the company's internal culture and make it more open, but stated explicitly the lack of a written long-term, non-financial strategy or vision at the company: "So I can tell you, we do not have a strategy. We do not have a vision. We do not have a mission." Looking at Company B, the Operations Manager felt the strategy was unclear, and it became evident that some of the other managers talk to each other about the company's strategy, but that that strategy was actually more or less a financial goal, not a true business strategy. Company B did not have an expansion strategy guiding their ongoing expansion into nearby markets. Many of Company A's strategic goals, too, were focused on financials. Both Company A and Company B also lacked a vision or mission statement.

In terms of risk-taking, none of the three companies expressed a high willingness to do so. Company A had, in the past, taken much larger risks than it does today, in terms of testing new types of products and business ideas. It was dynamic and market-leading in several areas, but evolved and settled into its current business. It is in a fast-changing, high-technology industry but has slowed to the point of lagging behind other competitors' solutions. Although the other two companies are not in industries that could be categorized as "high-tech," they have similar histories. Company C's founder was very inventive and willing to venture into the unknown in terms of ideas for new products, but the company has lost this level of inventiveness over the years. In the same way as Company A and Company C, Company B also tried out several business ideas in its early days and settled into its current place. All three companies are thereby very slow at moving into new segments and making large changes for future-readiness now.

The managers at Company C had a unanimously open view on innovation, understanding the importance of organizational and product innovation, as well as continuous and incremental process improvement, for the company's efficiency and success. These views were shared by the managers at Company A. The managers at Company B, however, had varying views on innovation, but mostly saw it only in the sense of creating new products, with the Sales Manager saying they do not have time to think about innovation. The Order Administrator did have somewhat of a grasp on organizational innovation and its importance however. They also see their products as very "rigid," in the sense that they cannot be changed or improved much.

When asked about how the companies would ideally like to support innovation efforts, managers from all three stated explicitly that they either "could not have a team of people sitting and thinking all day" or that there are always simply too many tasks to do, so even if the company had been twice the size, only a small handful of employees could be allowed to focus on one topic at a time.

While the managers at Company B do have a vision of that the company should continue to grow, that vision is expressed in financial goals. Additionally, many of the managers at the company lack an understanding of how big an impact small

organizational changes can make in the long-run and several of the managers (Order Administrator and Sales Manager) at Company B expressed difficulty in understanding how they could contribute with ideas for product innovation.

4.4.2 Innovation Efforts

In discussing the three companies' innovation efforts, and the potential to develop their innovation capabilities, it is essential to have an understanding of their products, services, and the process of developing those. Keeping these companies anonymous, the findings from the interviews related to the products will be detailed.

Firstly, all three companies are involve themselves in incremental innovation rather than radical innovation, and none of the companies has a *true* R&D department whose focus solely it is to research, test, *and* build new ideas. Instead, they each have some form of Product Development department, whose task generally is to develop the product or service *only once it had been decided on.* Yet, Company A and C both have rich histories of truly innovative products, and all three companies focus on high quality in their products, describing how they often last for years or decades. Company A exhibits a desire to be the first on the market with their new technologies, and they have had the market-leading spot in the past, but are now more of a follower, technologically, of other, faster development houses. For example, they knew a long time ago that the use of mobile phones would be big within their sector's solutions, but did not develop anything related to mobile until other competitors had already done it. Company B exists in a much more passive industry, where there are essentially no major technological leaders—everyone offers similar solutions, and the differentiation is based on product quality, support, and installation speed (usually along the line of weeks)—but the company's CEO still feels that competitors beat them in product development.

The three companies exhibit major similarities in terms of product standardization: they are all based on completely standardized base components, which are, in all cases, tweaked and tailored to fit the customer's use case, location, and overall system. This is the reason as to why production in all three companies is usually fast, but installation is complex.

Company C's products are relatively "independent," in the sense that they do not rely on being part of a larger "system" in order to be usable, or in other words, they could be installed in almost any relevant location with relative ease, but for quality and safety purposes, technicians lead the installations. Company A and B's products, on the other hand, must be "fit" into an existing system, and would not serve particularly many use cases alone.

Company B and C offer a very small number of products, while Company A has a larger portfolio (historically as well: many obsolete products are forgotten). In all cases, the products are split into a few major categories, with each product being slightly different within a category. The three companies also offer services

in the form of customer support and Company B and C offer quality control and "renovation" or testing services. Company B and C have recently broadened their solutions to include some electronic technology, but they lack much of the knowledge and skills needed to develop these further. In all three companies, but especially B and C, current product development is not focused on the development of completely new product types, but rather improved iterations and variations of the current ones.

Company A's Project Manager discussed the product development process in detail. The manager said that preparation work is utterly essential and that the company therefore makes sure to explore several ideas, choose the best ones to pursue further, and prepares a detailed development plan before focusing on one project to develop completely. They recently began implementing more automated testing processes in the development team.

The "lower level" of Company B is good at improving its work processes, slowly but surely implementing various improvements into its workshops and installation vehicles to make their work easier.

It was evident from the interviews with the CEOs and upper managers at all three companies that there is a general eagerness among them to become more innovative and successful. However, Company B often complains about being to rigid and standardized that there is not much room for innovation or new opportunities. Company A was without doubt the one with the most active form of encouraging organizational improvement, understanding the need for continuous change and learning, but its actions do indicate a level of lock-in to the current business. Company A's CEO is, however, people-focused, open to new ideas, and willing to improve, stating: "there's always something to learn and to improve." They also described how the management team created a policy of "not saying no" to new ideas, after some of the more experienced members of the management were shown to tend to be negative to younger members' ideas (as further discussed in Section 4.1.4. The individuals within the R&D team worked very separately in the past, but the new Project Manager worked hard to improve the team spirit and collaboration within the department when starting their job.

The Sales Managers at both Company B and C directly bring in such a large portion of the respective company's revenue that they have ended up with a lot of power in the company, in terms of decision-making, influence, and mindset. They both value constant customer communication, feedback and relationships, although Company B's Sales Manager was more focused on efficiency in their customer communications, while Company C's Sales Manager is more eager to build close, long-term customer relationships, even traveling to the factory location to show customers their products. The manager's initiative and drive to create a different sales strategy, attempting more upselling than previously, has led to large deals never-before achieved by the other sales managers at the company. The manager's mindset is one centered in ambition and leading by example, stating that Company C is an organization in which you can achieve a lot if you have ambition. The manager also

tries to motivate other employees to "go for more" and try new things, even if they fail. Company B's sales manager, on the other hand, is more narrow-minded when it comes to their relationships *within* the company, expressedly stating that they do not want to learn "irrelevant things," such as the specificities of the products, not seeing learning as an effort to understand the solutions and systems as a whole.

The interviewed Installation Technician at Company B is a particularly positive and open person, willing to learn and share. Although they have only been at the company for a short time, they have decades of experience at a large, innovative organization, which may be where they developed their care for quality and client-focus. While the technician is happy when things go well, and not just mad when things don't, they are determined that employees have to show enthusiasm and initiative, stating that if they had had the power to make large decisions in the company, they would have higher expectations and requirements on the employees to weed out those who do not show effort in learning.

This positive change mindset faces large problems at Company C though, because according to one manager at Company C, the management does not feel a sense of urgency to make processes more effective, and questions employees on their intentions if the employees suggest actions that could save work time. The Operations Manager at Company C not receiving their requested ERP system, despite the Factory Manager having one, indicates both a resistance to change, an unwillingness to list to employees, and a lack of clear communication and collaboration between the two company locations.

Even though the Project Manager at Company A was quick to say that constant development and learning is necessary, other managers at Company A do not seem to follow this maxim. For example, they visit a lot of expos but do not take much learning away from them. The participants go and promote the company's products but do not pick up many ideas from competitors or suppliers at the events. The same goes for when they receive calls from end-users asking about problems. Instead of gaining more information about the issue, and using the opportunity to promote their brand, they refer the end-user to the installation company that can actually help them answer the user's specific problem.

Regardless of their employees' views on change, all three companies have made major organizational changes in recent years, with Company A's product development team starting to implement Scrum in its daily work (albeit with inadequate knowledge on how to effectively design this new way of working). This change was led in large part by the team's Project Manager, who greatly improved the project requirement specification phase. The company also brought in students to do a specific type of project, outside of the firms internal expertise, as their university thesis work, and convinced the students to stay and the company, causing Company A to now have "permanent," internal competence in that field. The forward-thinking Project Manager made great contributions not only to the development team's efficiency and competence, but also creating the overall mindset prevalent in the team now of see-

ing the potential in ideas and taking initiative. Company B experienced a change of CEO, which brought with it better information sharing from the management team to the other employees and a more "open" culture.

All three companies offer learning and education opportunities to their employees, however, the employees need to take the initiative and ask for them. Many of the interviewees from Company B expressed a desire to receive more education and courses related to their work. They are not encouraged "automatically" by the companies. For example, Company B's Workshop Mechanic wants everybody in the team to know how to use all the machines and methods used in the workshop, but does not have the time or desire to teach them all, saying that the team members need to take that initiative themselves. Company A's Supply Chain Manager studied courses in economics and marketing and took part in leadership training outside the company during the time working there, and allegedly was "supported by the company" in doing so. Company C's managers described their access to training courses and their participation in a valuable workshop that helped them learn more about how to increase profits. They described an upcoming event in which they plan on doing some training in conjunction with other team-building activities.

Managers at Company B and C both described how, because of the tacit knowledge and lack of documentation, it is difficult for new employees to start their jobs and understand the processes—they have to deal with this learning themselves. The only clear area where Company B was described as having a good onboarding process was with the installation onboarding, where the Operations Manager was sent along with their future team to actively participate in, and learn about, the installation process.

Company B's Installation Technician described the issues with learning and competence in their team: there are several very young and relatively inexperienced employees in the team that are not skilled in customer communication. The technician thought of this relatively optimistically, willing to let them try and fail, as long as they learn, but other interviewees just saw their lack of experience in a negative manner. These employees are, however, eager to do their best in learning, and even teaching the even-newer recruits. The interviewed Installation Technician described how their job is tough but it is an environment where one can learn a lot, however, they added that some employees in the company have not learned and developed at the necessary pace, and were difficult to work effectively with.

Company C's managers described how after a project is completed, the Operations Manager has a debriefing meeting where the installation team reviews the project, but other employees from outside the team no longer participate. Because the installation technicians travel to customer locations so often, they were described by the managers as having become "blind" to some issues that exist at the customer sites, simply because they are so used to seeing them.

4.4.3 Idea Management

Ideas for new products or organizational processes or improvements enter the companies in various ways. Industry regulations are a large source of ideas: new rules mean mandatory changes to products, forcing the companies to adjust in some new way. The customers themselves rarely propose ideas to the companies, although in Company A's case, it happens occasionally. A major source of ideas for Company C was the installation technicians noticing issues on-site. Some of the managers were much more prone to come up with and put forth ideas than others. The heads of product development in Company A and C, and the CEO of Company B were such examples.

In Company B's case especially, the other companies and people surrounding its processes (e.g. suppliers, people that the installation technicians come into contact with when on-site, etc.) do not provide much information or ideas on how to make the "system" more innovative. In other words, Company B does not receive any external insights that could help it in its innovation journey. Although Company C's customers do not propose new ideas, they do occasionally come with requests for a certain new product function or feature. Company C thereby sometimes starts the product development process in this way, and does not "scout for" new product ideas.

What is clear in the idea evaluation approaches of all three companies is that they are very focused on the short-term. If an idea does not pass the requirements for it to be implemented efficiently, the company will not continue to consider it.

Company A has an official process and system for handling, managing, and storing ideas. This process involves submitting the ideas in an IT system, after which the ideas are individually scored (given points) by the managers. The employee who came up with the idea will receive a cash reward based on the number of points scored. Company C, however, does not have any structured system, like in Company A's case, to collect and store ideas from all employees. What they do perform is note-taking during R&D meetings that the management including Sales, R&D, and Factory Manager are often involved in.

Before Company A starts a product development project, its employees will brainstorm and then conduct small projects to test out ideas. Company A's suppliers actually assist them in enabling fast prototyping of new product ideas. They previously had an external moderator to help with and oversee these projects. They have a thorough idea evaluation process in which the R&D team discusses the idea amongst themselves and the managers talk to their salespeople and customers about the idea, evaluating their internal resources in the process to see whether an implementation of the idea is viable.

Company B has no formal system for handling innovation ideas. Its employees do not take any special initiatives related to exploring innovation. If an idea is thought of, its implementation is reliant on the employee taking responsibility for it and

pursuing it themselves. If the idea is easy enough to implement, it will usually be handled right away, alone (and they usually are able to test it: sketching it, taking it to the workshop, ordering the necessary components, etc.). However, if it requires special permission, the employee will speak with the CEO (who employees at the company associate with being innovative). If the CEO deems it too extensive or expensive a change then and there, the idea will generally not be pursued further. Time and cost are thus the main factors affecting the management of Company B in deciding whether or not to pursue an idea. These are the same factors affecting the idea evaluation process in Company C. Company C is, admittedly, more structured and thorough in its evaluation of ideas than Company B is, with the Head of Product Development describing how they will calculate the potential gross margin and take into account the necessary investments and resources.

4.4.4 Innovation Support Systems

Managers at the three companies are generally highly involved in the development of new products. At Company A, the Product Manager is a central decision-maker in choosing which ideas to develop, and the Project Manager takes over once the product idea has been decided on. At Company B, the CEO takes a much more active and central role in both coming up with ideas and evaluating them, discussing directly with the workshop employees how to build new product ideas. The company also has a Production Leader who is obviously involved in the production of new products and encourages their production team members to change stations in the workshop every now and then, which was said to be beneficial for their learning and ideation. At Company C, the Head of Product Development is essentially the sole, permanent employee involved in development of new products. The difficulty in this was clearly expressed when the manager described how handling their original, "classic" product line was easy, but the new type of technology they recently launched is more difficult to manage because of a lack of technical competence in that area. The company hires consultants for short periods of time when they need a new product idea developed. The similarity we can see is that at Company B and Company C, a very small number of upper-management leaders are involved in the NPD process.

The Factory and Operations Managers at Company C both aim for, as previously described in Section 4.1.3, having an open dialogue with their team members, and the Factory Manager tries their best to communicate the company's strategy to them. The manager is humble and has the mindset that money cannot be the sole motivational factor in a company, and has worked to implement reward systems and other initiatives to keep morale high.

Different reward systems and motivational factors were further describes as important dimensions to cultivate innovation, and showed to vary both in frequency and quantity between all three companies. The CEO of Company B explained that all employees are given health checks and wellness grants, but that no general bonus systems are used within the firm. Instead, their generally high salaries were assumed

to compensate for such a type of reward. The sales department, however, were described to get bonuses and commission's which was highly appreciated by the team as it motivates them to continue working hard even during extra stressful days. The CEO continued with explaining that events such as lunches, celebrations, and smaller trips are occasionally being arranged by the company in an attempt to motivate employees and create a stronger sense of community within the organization. The employees did, however, express a desire for more rewards after completing for example an intensive project or when staying extra hours, and one interviewee stated that even small things such as breakfast once a week or being invited for coffee would make a big change. This especially since several employees considered themselves to be valued lower by the company as a result of them not being given the same type of rewards as the Sales department. The Workshop department's employees were, for example, noted as mildly motivated to put extra effort into their work as no overtime is paid, but, nevertheless, they were described to motivate themselves by the desire of wanting to get home in time while, at the same time, deliver high quality of their work.

Continued, various events such as Christmas and summer parties, dinners, and theater visits were noted to be arranged by Company A in an attempt to motivate employees. Additional vouchers of own choice (for example used for going to the cinema, gym, or bowling-hall) were also described as being distributed on an annual basis to all employees. Unlike Company B, all employees at Company A were further presented to receive quarterly bonuses as a result of the various departments reaching its goals, as well as extra holidays when the company reaches good financial results. The Director of Supply Chain did, however, view the different goals and targets to be too high and unrealistic, thus, not sufficiently adapted to each department. The manager stated that the system was, at least in the SCM department, experienced as unfair by the team members since extra hard work was not guaranteed to be rewarded. Despite this, it was recalled by the Project Manager that employees at the company do get acknowledgment even after small achievements. The Project Manager also explained that an initiative system, previously described in Section 4.4.3, has been implemented where employees get rewarded when coming up with new ideas, for example, on how to improve or make various processes more efficient, or by which the company can save money. When entering an idea into the system, each idea is being evaluated by the management team and assigned a number of points by which the employee is being rewarded. This system was recalled by all interviewees, thus, well-known within the organization, and was clearly described as contributing to more ideas being raised within the company while generating an motivation for employees to be more committed into their work.

The reward systems implemented within the two main divisions of Company A turned out to vary significantly. The Factory Manager explained the implementation of motivational packages by which employees, both by doing a good job and to generally keep the motivation up high, get rewarded in various ways. Firstly, an employee of the month were described to be selected, and thereby rewarded for its well performed work by receiving, for example, spa tickets for two (can be both an

employee that have been working at the factory for a long time, or someone that has recently entered the company). Besides from giving the employees free fruits every Wednesday and arranging Christmas and summer parties, the motivational package were also explained to include birthday celebration by which all employees were offered free pizza or similar at the end of the month. The Factory Manager also encourage the employees to arrange team events by themselves, such as going bowling together, for which the company bears the cost. Apart from this, the Factory Manager showed to be involved in increasing the cooperation between the company's various divisions by arranging small events at which employees from both offices gather to both carry out small training's, get to know each other better, and have fun together. All these types of rewards and motivational factors were described by the manager to add another dimension to the reward system as money simply is not enough (even if it was viewed as important by the Factory Manager).

Additionally, other types of reward systems were noted to be present at the head office. Previously, a profit pool had been used within the company, but was removed when new financial targets were being set. The Sales department, however, was described to have a simple commission system while other departments were noted to be discounted from such rewards. Thereby, the Operations Manager expressed an desire of being given more rewards to employees within all departments, and especially for the Operations team. The R&D Manager however did explain an increased motivation of performing a good job by having been a part of the company from start. Lastly, a "spot system" was also described to soon be initiated within the company by which employees will be rewarded with an instant fixed bonus for coming up with good ideas from which the company, for example, can save money.

5

Analysis & Discussion

The purpose of this chapter is to analyze the empirical data with reference to the literature and conceptual framework, and present and discuss the findings of the analysis to answer the two research questions brought forth in Section 1.4. First, a conceptual, schematic model is presented that illustrates the factors that affect the innovation capability improvement process at the studied firms. Presenting this model in the beginning rather than the end of this chapter allows the reader to visualize this process and keep it in mind while reading the subsequent sections that served as a basis for its creation. The following section answers the first research question, listing the problems found to be experienced by the studied SMEs. After that, these problems are discussed and general solutions or improvement areas from the framework and literature are suggested. Next, the resulting adjustments to the original innovation capability evaluation framework presented in Chapter 2 needed to more accurately represent the situation of established SMEs in niche technological industries are discussed.

5.1 Model

Figure 5.1 shows the final conceptual model for understanding the innovation capability improvement process at the studied SMEs, based on the framework (Table 2.1) presented in Section 2.6 and the needed adjustments to the original framework based on the actual problems found to affect this type of company and the solutions that follow (discussed in the following Sections 5.2 and 5.3). The company's internal factors (resources, processes, systems, and culture) are shown as directly affecting the level of innovation capacity enjoyed by the company. The resources, processes, and systems that a company possesses, in combination with its external market/industry environment, are shown to affect the company's direction, which in turn has an effect on the company's internal factors (due to the firm's strategy and mission indicating what future resources to employ, processes to implement, and culture to pursue). In this way, one can see that all four dimensions discussed in Chapter 2 are essential for an established SME's innovation capabilities, either directly or indirectly. However, there are some interesting details not applied directly from the original framework that will be discussed in Section 5.4 as being a direct result of the investigation and analysis's findings.

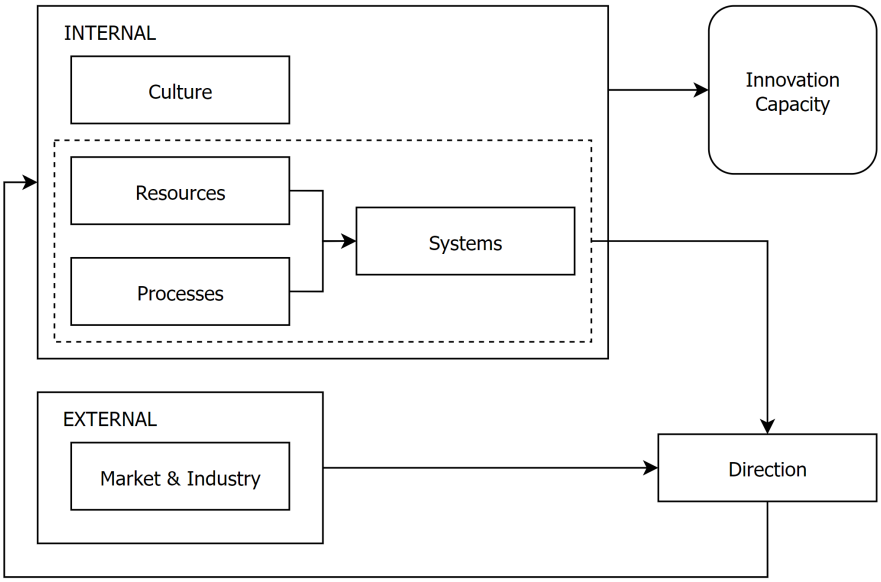

Figure 5.1: A conceptual model for understanding how the studied SMEs should ideally work to improve their innovation capabilities

5.2 Problems

In an attempt to answer Research Question #1, restated below, based on the investigation of the three established SMEs' current organizational resources and capabilities, the subsequent main problems were identified to be experienced by these established SMEs.

> RQ #1: *What problems do the studied established SMEs tend to experience that influence their level of innovation capability?*

Regarding the companies' structures, they have very small R&D departments, which has caused a limited ability to pursue innovation developments. They experience "silo mentalities" due to the separation of teams and departments. Specifically, installation teams are not valued or integrated into the rest of the organization. Because of this departmental separation, cross-functional team is generally poor. Broad roles in these organizations have overwhelmed employees in terms of workload and insufficient clarity concerning responsibilities. The companies do have some highly specialized internal competence, but do not actively create opportunities for sharing that knowledge. The most driven and initiative-taking employees are relied on and used too much by those employees who are not as driven. Despite being highly profitable businesses, these companies are not allowed to invest much back into their R&D. This causes great distress among managers and is blamed by them as the reason for a lack of innovation. The companies have relatively free access to university students but tend to use this access minimally, and tend not to integrate them enough into their organizations. The collaboration between these companies

and their external industry peers in innovation development is not non-existent, but tends to be low.

Despite being small, the internal communication in these companies is often unclear and inadequate. Organizational learning is limited to special occasions and employee education only happens on one's own according; it is hardly proactively encouraged, and in fact discouraged to certain employees. This problem of the requirement of taking initiative for things that should be given proactively crosses over into the employees' understanding of their colleagues' work: there is ambiguity in who does what at the organizations. This is further problematized by the poor documentation of work responsibilities and processes. Although the strict regulations in these companies' respective industries was regarded as a source of ideas, the companies *rely* on these regulations and do not look elsewhere for innovation ideas very often, always staying in the confines of their existing niche. The companies tend not to have structured idea management systems, resource planning systems or reward systems for recompensing employees for great ideas. They generally evaluate ideas with a short-term focus in mind and are not willing to test ideas that seem risky at first.

Regarding their corporate cultures, the companies generally struggle with maintaining a sense of community. The companies' employees often do not feel comfortable bringing up issues because of two main reasons: a fear of being blamed for the issue at hand and a fear of not bring listened to because of high workloads. Additionally, employees tend to hear when something negative has happened or a mistake has been made, but not praised when they have made a good effort. When an employee has a good idea for an innovative process, they tend to be, or at least feel, required to go to top-level management for permission to implement the change.

Lastly, one of the largest, high-level problems experienced by these companies is the lack of clarity in their long-term strategy and vision, and the absence of a mission statement.

5.3 Discussion & Solutions

To answer Research Question #2, repeated below for reference, the issues brought up in Section 5.2 will be discussed in the context of the framework dimensions (see Chapter 2) that they pertain to.

> RQ #2: *What organizational factors ought to be implemented by the studied established SMEs to improve their innovation capabilities in a feasible way?*

Issues regarding the three niche-technology, established SMEs' resources, processes, culture, and direction will therefore be examined, and improvements discussed with the goal of improving their innovation capabilities.

5.3.1 Resources

Concluded from Section 2.2.1, the organizational structure of a firm was to be outlined as the core foundation from which innovation thrive. Such a view could not be derived from the collected data, which instead pointed towards that the predetermined structure of a firm should be taken into account when implementing the remaining dimensions used to foster innovation. Although the benefits of being able to adapt the company's structure to cultivate innovation are considered large based on its given opportunity to simplify the implementation of, among other things, the internal systems, processes, communication, and collaboration, this was not considered a possible alternative for established SMEs, especially given its limited access to time and resources. Accordingly, the possibility of having a loosely-coupled R&D department, presented as favorable by O'Connor (2008), further proved to be limited within the companies studied. Alternately, the companies were shown to have narrower boundaries between the R&D department and the remaining parts of the organization. This was, in the case of Company C, illustrated to force the employees to perform tasks outside of the area of R&D, and thereby limited their ability to perform innovation. To counteract this outcome, multiple alternative remedies can be discerned. Firstly, by expanding the integration of university students, the companies could relieve work from the R&D team while simultaneously access external knowledge, complementary to the internal areas of expertise, entailing the opportunity to increase the realization of both organizational and product innovation as seen in the case of Company A. To minimize unnecessary tasks and responsibilities of the R&D team, without overloading the remaining departments, as well as to increase the efficiency of the more comprehensive parts of its internal process would, based on the companies studied, further serve as a way to reduce the emerged broadness experienced.

Further, in the case of a non-existent R&D department, as in Company B, a significant difference could be discerned in terms of the level of innovation performed compared with, for example, Company A. In Company B, a more individual-based R&D process turned out to take place within which sole ideas were realized by one single employee, for example the CEO, personally taking on the main responsibility of exploiting it. This puts emphasis on the importance of, within the organizational structure, making room for innovation work and ensuring that it is performed, regardless of whether it is carried out by a separate department or through a joint effort between multiple employees within the company. What became clear from all companies was that attention needs to be put towards innovation, thus, that there needs to be a delegated responsibility within the organization with the task of monitoring and realizing various steps of the innovation process, independent on how it is being performed. Additionally, as presented in Section 2.2.1, some degree of "cross-functionality" were to be viewed as positive when compiling a team to pursue various innovation efforts with, among other things, the purpose of supporting and encouraging organizational learning and collaboration as well as increasing the internal idea generation. However, no such team-based structure could be discerned recurringly present within any of the companies, nor was it identified to be replaced by any other ways of sharing previous experiences or knowledge between depart-

ments. Consequently, the usage of such a structure, even if it only means for a short period at a time, as proposed by Tyre and Hauptman (1992), clearly counter many of the drawbacks followed by the companies current ways of working, thus, can be viewed as beneficial for established SMEs.

The outcome of generally having far too separate individuals, teams, or departments, created either through a physical distances or by not being sufficiently integrated with the remaining parts of the organization, also proved to negatively affect the company's innovation capacity. Such an arrangement was outlined, mainly within Company B and C, to not only impair the internal communication and collaboration, but also reduce the mutual understanding, the sense of community, and the idea creation between the various parts, while increasing the tendency of creating a silo mentality. With this amount of disadvantages, all related to a firms innovation capacity, it is clearly understood that the various parts of the organization should all be well integrated to the core of the organization, unless the opposite is well justified.

Continued, all three companies were identified to carry highly specialized internal competencies, but that competence tended to be locked into a specific area of expertise. A clear process for sharing knowledge or experience was therefore seen as missing, especially within the cases of Company B and C. However, to support innovation by the diffusion and harness of an organizations competence base and internal resources is, as stated by Lawson and Samson (2001), an eminent way to support innovation, and thus viewed as an necessary dimension for increasing the innovation capacity of an organization. To achieve this, Keskin (2006) address the implementation of systems and processes for sharing both knowledge, skills, and previous experiences as favorable. Raghuvanshi et al. (2019) adds to this statement by explaining that to utilize learning within an organization, employees must possess the motivation to take part of the knowledge presented to them, which then suggest that the employees must also carry a certain level of drive in order for the implemented mechanisms to have an effect.

Another attribute, akin to the internal competence of an organization, is, as presented in Section 2.2.2, the skills and characteristics of the employees. Derived from the data collected, a generally high level of competence could be discerned present within all three companies based on the employee skills, presented by Romijn and Albaladejo (2002), to correlate positively with an increased ability to innovate. Company A exhibited a competence base characterized by both a diversity of engineers and a relatively high mix and integration of both "younger" and "older" employees (in terms of both its age and time spent at the company), of which some, for example the Project Manager, was found to possess an "entrepreneurial orientation" as described by Börjesson and Löfsten (2012). A combination of the ideal archetype of broadly skilled and flexible employees as presented by O'Connor (2008), and the driven, enthusiastic employees with a high education level, conferred by Börjesson and Löfsten (2012), were to be found in Company C. These "driven" employees, however, turned out to be assigned a higher proportion of tasks compared to those

who did not possess such types of qualities, and did thus experience an accumulating workload and reduced time to realize various innovation efforts. The company was therefore identified to heavily rely upon sole individuals and thereby lacked an overall and consistent willingness to support and diffuse innovation. Additionally, to determine which of the different types of sought-after individuals presented in 2.2.2 that contribute to the greatest increase in established SMEs innovation capacity, is viewed as neither viable nor supported. Instead, to address the experienced difficulties, the companies can be recommended to both generally minimize unnecessary tasks from all employees, while, at the same time, urging them to have a drive to take their own initiative to handle appointed tasks in increasingly efficient ways, which derived from Section 4.1.4 could be induced by improvements in cultural aspects. Likewise, as presented by Börjesson and Löfsten (2012), the manager should have the property of having a willingness to strategically commit resources to various innovation efforts even in uncertain circumstances, allowing the competence base to thrive.

If one further touches upon the subject of resources, Iddris (2016) address a company's ability to exploit its available resources as a part of its innovation capability, whereas two of the forms is presented as financial and external resources (with the remaining being human and technological resources). As previously described, all three companies, by their very own nature, are characterized by a reduced access to financial resources internally. These were, however, discovered to be allocated differently and to a varying amount with regard to innovation measured by their level of designated workforce (which in this case is considered a financial resource due to the cost of employing human resources) and allocated support mechanisms (such as technological resources). Another consistently manifested dimension discovered was that the companies tended to blame their lacking innovation capabilities on the very lack of financial resources (partly as a result of the increased constraints expressed stemming from its relationship with their parent company). This mindset proved, mainly within Company B and C, to minimize the willingness to actually dedicate not only financial resources, but also all other types of resources in an attempt to increasing their innovation capabilities. This highlights the need for an increased understanding of the positive consequences of performing innovation, an increased prioritization of investing in innovation, as well as a change in mindset around how to achieve innovation capabilities and, thus, how to become an innovative company.

Turning page towards external resources, Lichtenthaler (2008) found that firms who *proactively* open their doors towards externally-centered innovation process tend to enable more "important strategic innovations". Hossain and Kauranen (2016) adds to this notion by indicating that SMEs perhaps should focus on maintaining intensive rather than extensive collaborations based on their lower amount of resources. The authors further describe that external resource organizations (especially universities) are viewed to be such a connection to the external environment, suitable for SMEs. Derived from the data collected, it is confirmed that the usage of external university students do bring multiple benefits with regards to an established SMEs innovation capability (for example, access to knowledge outside of the internal area of expertise,

and thus an increased idea generation), as seen in Company A. However, to make this type of collaboration manageable for these types of companies, a balance is considered necessary by which the return and exchange is greater than the cost of implementing and maintaining such a partnership.

Another aspect that can be discerned as somewhat connected to the previously described linkages to external resources is the collaboration with both suppliers and customers performed by each company. Derived from Chapter 4, all three companies were identified to have a good relationship with the aforementioned parties, but still did not show any extensive collaboration through which, for example, ideas and knowledge were exchanged. Such an arrangement, partly seen in Company A, is however considered favorable by Boeddrich (2004) with regard to the increased possibility to use this obtained relationship to capture ideas and knowledge about both the market and the customers. The companies can thereby be recommended to both review their current constellations as well as the future ones to see what opportunities present themselves, as well as identify what disadvantages already-established agreements entail. For example, the issue of Company A and B being locked-in to sales through their direct customers brings advantages such as a stable distribution channel, but also the disadvantage of not being able to gather direct information from either the end-customer or the end-user of sold products and services. In summary, the companies need to be conscious of both the benefits and drawbacks of the various types of external collaborations they expose themselves to.

5.3.2 Processes

The companies experience many issues related to their internal processes, that, if solved, will improve their innovation capabilities. Firstly, their internal communication was often found to be inadequate, either being too informal and unstructured, causing a lack of awareness among those not included in the communication, or being indirect, complex, and convoluted, causing uncertainties as to where the information had come from or was going. Organizational innovation is highly dependent on good and effective internal communications, as explained in Section 2.3.1.

The companies need clearer systems and processes to handle and coordinate the communication and sharing of information throughout their organizations, the importance of which for the firm's competitive advantage is explained in Section 2.3.1. Purposive organizational learning at these companies is infrequent: feedback on projects and processes is generally minimal and limited in nature and reviews are only conducted on a small-scale basis. One of the companies, and specific teams in the other two, did show active reflection and improvement efforts, which resulted in a more positive culture and better processes in those cases. Nonetheless, the extent to which these reviews and learning occasions are performed should be increased in the rest of the organizations to give them the opportunity for constant improvement, leading to more ideas and processes better suited for innovation.

The problem of employee education and learning being an individual responsibility

not actively encouraged at these companies is negative for their innovation capacity. As the education of employees is favorable for organizational learning (as described in Section 2.3.1), relevant learning should be encouraged more actively by the companies. Because of the small size of these companies, managers tend to be highly versed in the abilities of their employees, and more specifically, know exactly what they have not been able to do in the past. This has caused the serious problem that in some cases, managers discouraged certain employees from learning a new technology or process, seeing their education as pointless simply due to their failure to learn a technology in the past. This indicated a cultural issue related to the managers' view on failure, which must, in the problematic cases, be improved to be accepting of trial-and-possible-failure, following the recommendations in Section 2.3.3 and 2.4.1.

The problem of employees at these companies not receiving education unless having asked for it themselves is reflected in another issue related to internal communication. Unless an employee takes the initiative to learn about the other departments or the responsibilities of the other employees by themselves, they tend not to find out what the other employees actually do or how they perform their work tasks. With this having caused confusion regarding who to turn to when an issue presents itself, the companies need to engage their employees in processes meant to increase their knowledge of the other organizational functions. The literature brought up in Section 2.3.1 presents a simple solution to this: moving employees between units, which, in the context of these companies, could involve having the employees go around, talk to each other, and experience the work of other employees in action, which would promote cross-functional knowledge sharing. A solution like this would aid in solving, but not completely fix, the problem of employees not knowing exactly what it is their coworkers do on a daily basis. The other dimension affecting this problem has been found to be the poor documentation of employee roles and processes. This has been identified through the interviews as causing a risk for the companies: they become very vulnerable when an employee leaves the firm. The combination of not being able to easily substitute roles and most roles being very broad and strenuous in workload means that if an employee leaves the company, a large percentage of the business's operations will be jeopardized. A clear solution to this problem is a better system for documenting processes and clearer definitions of employee work responsibilities. This was proven to be greatly effective in the company and team that had come the furthest in the implementation of this.

The tight regulations of these companies' niche technology industries has caused them to not be very proactive in looking for innovative solutions, but this goes directly against the recommendations found in the literature. Section 2.3.2 described how important it is for SMEs to be "future-thinking" when it comes to their market, and also act on the most relevant information available about their environment. Therefore, these companies must improve and increase the frequency of their learning processes and analyze competitors more to exploit their weaknesses. This was exemplified by the development of their latest product at the company that had come the furthest in the development of their innovation capabilities, and is further

supported by Lawson and Samson (2001) referenced in Section 2.3.2.

The issue at all these companies of a mindset highly fixed within the confines of their technological niche has caused these companies to not take the step to look outside their niche for new ideas, with managers saying that they do not see the potential or benefit of doing so (as they are comfortable and experienced within their area of technological and business expertise). As will be discussed in greater detail in Section 5.3.4, a shift in the companies' vision towards the long-term would likely cause their focus, in terms of idea sources, to broaden, thereby future-proofing their innovation processes.

Perhaps the most clearly identifiable problem affecting the innovation capabilities of these companies was the majority lack of structured systems for organizing processes and resources. This has been discussed in various ways throughout this chapter, but the most direct way that this lack can hurt innovation efforts at these companies is not having an "idea management system." The presence of such an idea management system was proven to be a key factor affecting the innovation capabilities of the studied firms. One of the interviewed companies has a clear process for submitting (product or organizational improvement) ideas, a computer system set up for storing them, a structured process for the managers to review them, and a standardized reward system for employees to enjoy. The reward system in the successful company's idea management process specifically (and effectively) combated the problem of employees tending to stay quiet unless having an underlying incentive to bring their ideas forward. Confirming the literature of Section 2.3.3 that highlighted the importance of systematically managing ideas, the existence of this system has provided the company with the opportunity to pursue ideas at a much greater rate than the other two companies, which do not have any structured system for idea handling. As mentioned in the discussions of the other dimensions analyzed, these two companies evaluate their ideas in the unstructured manner of consulting with a manager or the CEO directly, which was shown in those cases to create a short-term focus for ideas, in that the fastest ones to implement are prioritized. Implementing a structured idea evaluation and rating system will allow them to weigh the importance of short-term and long-term goals more fairly when it comes to possible ideas to implement.

As described in Section 2.3.3, companies should allow for experimentation of ideas among their employees, and with one of the companies doing so systematically, it is a clearly important aspect for the improvement of innovation capabilities of these firms. For this reason, small-scale, prototype testing must be made a part of this idea management and evaluation system. This will additionally allow the companies to find out more about different directions they could develop in, as will be discussed more in Section 5.3.4.

In tandem with an idea management system, it is essential that these companies have structured enterprise resource planning systems too. Two of the companies, again, showed a lack of structure in this domain, with some managers having cre-

ated their own, "custom" systems for organizing work and resources, especially in the Operations/Installation departments. The interdependence of these two forms of systems is clear, and some of the employees realized this themselves, with one manager stating that employees have many good ideas, but because of an overload of disorganized work, they do not have time to pursue and develop those ideas. Because of this, it is absolutely crucial that SMEs like this have structured, standardized systems to handle both ideas, resources, and projects, allowing them to free up time for R&D and innovation work.

5.3.3 Culture

Because of the small size of these companies, improvements in innovation capabilities will be made significantly easier if they are able to improve the culture and personal relationships between employees.

Despite the small size of these companies, there was still a clear sense in all of them that socializing within teams, departments, or other types of "cliques" was prevalent, and was much more free and open than the communication with the rest of the company. While it makes sense that one will collaborate significantly more with one's immediate team than a manager in another department, for example, the social aspect in that dimension should still be open, reliable, trusting. In other words, these companies must create and maintain a better sense of community among employees, making sure that the "shared values" (see Section 2.4.1) truly are shared between everyone in the organization. In the beginning, this will mean forcing employees out of their comfort zones, to speak and share more with other organizational functions. Holding company-wide gatherings on a more frequent basis (in the form of everything from simple coffee breaks to predetermined team-building activities or trips) may significantly improve this issue. This will in turn lead to a higher willingness to share ideas with various members of the organization, and work together to solve problems and investigate new solutions, decreasing the "silo mentality" brought up in Section 2.3.1.

The general lack of time due to high workload and broad responsibilities at this type of company has had many troublesome effects on the organizational culture. With employees who have ideas abstaining from bringing them up with coworkers for fear of placing more workload on them for something that "might only make a minor impact," this highlights the need for two things according to the recommendations in literature. The first is a more open culture in which bringing up ideas is not impeded by doubts, and discussing them openly is thought of not in terms of the workload needed to implement the ideas, but as an opportunity to develop them further, maximizing their utility. The second is the straightforward, structured system for storing and handling ideas, as described in the previous section.

A high workload (due to broad responsibilities) was not the only factor affecting the raising of issues at these companies. There was a sense that, in the subset of these established SMEs with poorer innovation capabilities, employees refrain from

bringing up issues because that issue would subsequently have been labeled as "their problem." In other words, there was a "blaming culture" present to an extent. This has naturally led to underlying issues not getting solved and a lack of innovative ideas getting picked up and handled by the companies, in turn leading to worker dissatisfaction, frustration, conflict, and lack of innovation. This cultural problem must come with cultural solutions. While the small size of these companies likely makes IT-based issue reporting and whistleblowing systems unfeasible, they must have a culture that allows for issues to be brought up openly. In line with the friendly and open leadership mindset recommended in Chapter 2 combined with the mindset that failure is okay (Section 2.3.3 & 2.4.1), managers need to make sure they give their employees the feeling that they can come to them with issues and ideas, and truly be listened to. In the start, the managers might have to actively ask their employees about the issues they have, in order to kick-start this process, but through the aforementioned team-building activities and social occasions, a more naturally open culture will hopefully develop.

Aside from the reward systems used for the management of innovative ideas, these companies have shown a clear need for more general motivational factors, mainly to be rewarded for hard work. With many employees working long hours to keep up with demand, the companies should implement motivational systems so that these employees feel appreciated and feel that they get something in return when having worked hard. In line with Section 2.4.1, the reward system, which may come in the form of a financial bonus or similar rewarded for individual effort, must be fairly distributed across the entire organization and communicated transparently. This means that no one department should have sole access to such a system, because that would (and currently does) lead to jealousy and underlying conflict between them and other departments. Also, all employees needs to be elucidated on what steps will specifically get them to the achievement of that reward (the "criteria to be satisfied" in Section 2.4.1). Importantly, these criteria may not be unrealistically difficult to achieve, as is currently seen in the companies.

These general rewards for hard work should not only come in the form of a monetary system, though, but should also be omnipresent in the general communication among firm employees. In direct connection with the "blaming culture" described above, the less innovative companies tend to focus on the mistakes and negative things done by employees, not showing enough gratitude and praise when someone has done a good job or put great effort into a piece of work. This is expected but not appreciated: instead, it should be both. To increase motivation, managers should praise their teams and employees who have done a good job and they should make sure to encourage their employees to praise each other too on jobs well done. The positive culture should exist across all relationships. The "employee of the month" motivational system at the factory location of one of the interviewed companies was a perfect example of a well-functioning system for showing gratitude.

A significant area of the framework's cultural dimension is that of support from leadership, specifically for innovation. The employees at these companies often have

ideas on how to implement various innovation efforts (e.g. organizational innovation in the form of workflow improvements or new ways of working), but they do not feel that they have the required knowledge, experience, or ability to perform that change by themselves. The management of these companies needs to realize that they are responsible for making sure that their employees have the necessary tools, systems, and resources (including knowledge) to perform better work and innovation, as discussed in Section 2.4.2.

The literature brought up in Section 2.4.2 hints at the hurdle of micro-management and the controlling leadership style that hurts innovation. Employees should feel empowered and encouraged to take their own initiative toward goals. Thankfully, this was not identified as a general problem within the companies and they should therefore continue to give their employees the freedom of forming their own roles, and how they perform various tasks should still be up to each individual or team, but importantly, they should be aided by well-functioning systems. With that being said, these is a sense of control present when it comes to idea handling. Currently, employees tend to seek a manager or CEO to ask permission or confirm whether or not they should pursue an idea, but this has been shown to take up the time of all parties involved and lead to less creativity. Instead, the managers need to give their employees the freedom and opportunity to take their own decisions regarding ideas. This goes hand-in-hand with the empowering leadership style recommended in Section 2.4.2, where employees should be encouraged to take decisions autonomously. This should not contradict the notion that employees should feel comfortable discussing their ideas openly, however, and the ideas that would benefit from collaborative evaluation should absolutely be entered into an idea management system.

5.3.4 Direction

One of the most obviously worrying aspects of the companies researched was the apparent lack of any clearly stated, formal vision or mission statement. Referring back to Section 2, the existence of a clear and actionable mission statement was theorized to be a central component in creating good innovation capabilities. While many of the interviewed managers were quick to affirm that their company's strategy was clear to them, they often failed to state, aside from monetary goals, exactly *what* that strategy entailed, and there was never any mention of a company vision. While the ability of these companies to be flexible to the frequent industry changes that affect them is a generally positive thing, that is not a justification for not having a fixed vision, as some interviewed managers saw it. Clearly, the companies should adapt when their markets change, but to be able to do so more effectively and proactively, they must be prepared and have a clear direction to develop in when an external change happens. The non-manager employees of the companies were shown to be even less aware of their company's long-term goals, and the linkage between their hard work and their company's success and customers' gratification was barely perceived, which undoubtedly contributed to the overall passiveness and complacency of the "average" employee with respect to innovation efforts in this

type of *mature* company. Although this is such a deep, almost ubiquitous problem, it can easily be solved through improvements in culture and strategy, starting, again, with the creation of a clear company direction.

All of these companies should begin gathering the perspectives of their employees and start developing a mission statement. From there, flexibly creating business strategies to handle current and future products and services will make sense. In line with Alavi and Karami (2009), brought up in Section 2.5.1, *all* employees should be involved in this process. Company gatherings, meetings, and especially team-building activities, offer suitable opportunities for collecting employee insights, thoughts, and ideas on how they currently see the company and what they see its purpose and future being. Using this information, the top-level management, salespeople, technicians, and factory workers alike, should all come to an agreement on how the small company's mission statement should actually be defined, making sure to focus not on financial goals, but rather a high-level vision that integrates their technological competence and care for what they do. Following the recommendations from Section 2.5.1 like this will make sure that everyone feels they play a part in the process and actually contribute to the company's success. After having adopted a clear mission statement, these team-gathering opportunities can be used moving forward to spread the long-term vision of the companies, making sure that they are always in the back of the employee's minds.

This entire process will have the added resulting benefit of increased employee motivation, as their hard work will more clearly be coupled with a long-term goal. To increase this motivation even further, customer care must not only be included in the company's mission. The customers themselves, or at the very least their feedback, must be more heavily integrated into this type of niche technological organization, following the recommended customer awareness stated in Section 2.3.2. Employees that do not directly interact with the customers should be informed by the aware manager as to the specific customer or project that their work is intended to be delivered to, and the customer's opinions and satisfaction surrounding delivered solutions should be fed back into the organization in a visible way, to show exactly how each employee contributes real value to the end-customer. Creating a customer-centric focus in the companies' strategy is the first step to achieve this.

Naturally, the development of strategies cannot solely be based on opinions, which, again, brings up the issue of testing new ideas. Having an idea management system and an efficient prototyping and development process for those ideas (as outlined in Section 2.3.3) will lead to more clarity regarding which strategies to pursue. Being able to evaluate and pursue multiple related ideas may give more leverage in the event of a significant market change. In other words: if the industry were to shift and a large change in business models or sold products is necessary, then, having a more diversified portfolio with multiple products or business models that fit into that new, altered market, or at least being able to prototype new ideas quickly, would be beneficial and may increase the likelihood of long-term survival. To summarize this idea, once these companies have decided on a company vision and mission

statement, the "strategic guidelines" for innovation ideas (see Section 2.3.3) will be clearer. From there, the development of diverse ideas will both follow the company's overall direction and be able to indicate new specific future strategies.

Another problem these companies face related to their strategic opportunities is them limiting themselves through the various agreements they engage in that constitute their current business models. This is in line with the view of Assink (2006) of the risk of staying too close to one's customers (see Section 2.3.2). Although the distribution and installation deals they have are a basis for great relationships with their *direct* customers, the current strategic lock-in to these deals has resulted in their end-customer relationships suffering. The companies must therefore make sure that in their formulation of long-term strategy, they allow for the exploration of new business models and new ways to gather information from all actors in their sociotechnical system, including end-customers (as recommended in Section 2.3.2). To do this, the managers of the companies should come together and conduct an "investigation of stakeholders" (as recommended in Section 2.3.3), discussing the various agreements and collaborations they are currently affected by and will be affected by in the future, to raise awareness for how the company should handle those relationships, i.e. both taking advantage of their benefits and working around their drawbacks. This understanding must subsequently be woven into their short and long term strategies in order to make use of the good opportunities they have through the existing agreements and plan for innovative opportunities external to these agreements, e.g. opportunities that do not hinge on going through distributors. Connecting back to previous paragraphs, a strategy like this would hopefully increase the visibility of innovative solutions and end-customer ideas to company employees and clarify the value of their personal work on the entire system their company exists in.

5.4 Implications for Framework & Model

Although the framework for analyzing innovation capabilities shown in Chapter 2 (Table 2.1) has been very helpful, allowing for a comprehensive analysis, it was largely based on the theory surrounding innovation capabilities at companies in general, with little focus on the topic of this report: established SMEs in niche technological industries. To fulfill Goal #3 of this report (see Section 1.5), i.e. creating a framework or model that can be used effectively on established SMEs specifically, the schematic model (Figure 5.1) presented in Section 5.1 is an adjustment of the original framework, emphasizing the issues that were found to be of particular importance and minimizing the visibility of issues that were not found to have such a strong influence on these companies.

The overarching framework dimensions: resources, processes, culture, and direction were all found in the analysis (Section 5.3) to suitably categorize the issues affecting the firms' capacity for innovation, and are thus clearly identifiable and included in the final model. However, the constituent parts of each dimension were not shown to be of equal importance.

Within resources, structure was found to be of less *direct* importance than previously thought. While it became clear that a highly hierarchical or silo-ridden corporate structure, for example, would not serve innovation well, it seemed that structure was more of an underlying factor for functioning internal communication, and that it is the internal communication and organizational learning that is what affects innovation capability at these firms, not the specifics of their structure. An example of this was that the team-based structure recommended in Chapter 2 was present in the development and installation teams in the companies but its benefits were only seen when they communicated well with the rest of the organization.

Financial resources, discussed in Section 2.2.3 were found to be largely irrelevant when gauging the innovation capacity of these SMEs, for the simple reason that they, by definition, cannot invest copious amounts of money into R&D. Financial resources certainly have an effect on the innovation capacity of these companies, but given that these resources are distinctly limited in their cases, emphasis should be placed on taking advantage of the resources that the companies currently have available. As a result, these SMEs would neither blame their innovation shortfalls on a lack of money, nor would they solely see obtaining more resources as the solution for carrying out innovation efforts. With that being said, the managers' mindset on the financial resources available to them was found to be significant, with the lack of financing being somewhat of a scapegoat for not being more innovative.

Perhaps the most significant finding affecting the original framework was the new-found importance of internal systems for these companies to enable innovation. These systems, discussed in Section 5.3, can be categorized into three main types: *documentation and process management systems*, *idea management systems*, and *reward systems*. It was shown that not having a technical system to organize workflows led to disorganization and extra workload that decreased the time for innovation efforts. It was also clear that a technical, structured idea management system allowed one company to frequently enjoy the generation of a multitude of innovative ideas with a long-term outlook. Lastly, the reward systems in place at some of these companies directly increased the propensity of employees to work hard and submit innovative ideas. A final, additional note is that these systems were put in place to organize resources and streamline processes, and can therefore be considered a result of these two dimensions, as shown in the model (see Figure 5.1).

6

Conclusion

The aim of this thesis report was, in a general sense, to discover what problems affect the ability for established SMEs in niche technological industries to be innovative, and to identify suitable solutions for solving these problems with the goal of an improvement in innovation capacity. Specifically, the investigation set out to answer two specific questions centered on the cases of three specific, chosen SMEs: *what problems do they experience that influence their innovation capability?* and *what organizational factors ought to be implemented by them to feasibly improve their innovation capabilities?* This aim was fulfilled through the study of relevant innovation management literature and the extensive conducting of in-depth interviews with employees of the chosen companies.

The findings showed that the three SMEs experienced a variety of issues affecting their capability to perform innovation work. As known since the beginning of this investigation, Company A had come the furthest of all three companies in its innovation development, and the results showed this clearly. The problems they face are relatively minor but do exist nonetheless. Specifically, inter-departmental communication, fairness in their motivational reward system, and end-customer/end-user interaction is generally poor or not used constructively. The issues Company B faces are largely due to poor communication between departments, a slightly negative culture, the lack of an idea management system, and an unclear strategy. Similarly, Company C's main issues are: a lack of functioning, structured systems for idea management and documentation (which would free up time for e.g. innovation development), a culture not focused on collaboration and innovation with somewhat of a top-down management style, and the lack of a clear, long-term strategy and vision.

Summarizing these issues and connecting them to the literature resulted in a number of conclusions and recommendations. The extensive use of structured, internal systems at one of the companies has shown promising results in terms of innovation development. Thus, while it is not a current problem for all established SMEs, it is evident that the use of structured systems for idea management and documentation is absolutely essential for them to increase their innovation capabilities. It was additionally found that clear systems for rewarding original ideas will directly lead to increases in NPD. Collaboration with university students in the research and

development of new technologies was shown to allow for a significant increase in the innovation efforts at these small companies. Having a true R&D department with a cross-functional nature and clear communication with stakeholders proves beneficial for companies like these. Clear systems for communication like this are also essential within the companies' internal processes to ensure transparency and trust in work processes. Culture has also been shown to be a central aspect for facilitating innovation capability improvement at these SMEs, who each have varying levels of positivity in their cultures. It can be deduced from the results that these companies must ensure that their cultures are characterized by openness (the ability for employees to confidently bring up issues and ideas without running the risk of being "struck down") and a positive team spirit (a sense of community where employees trust each other and are eager to work together to solve problems). An unambiguous reward system for hard work and underlying motivational team-building events were shown to be effective components in creating such a culture and increasing employee well-being. Whether management style can directly be considered part of a firm's culture is unclear, but the concepts are linked, and the leadership in mature SMEs needs to be innovation-focused, collaborative, and open with all levels of the company, while simultaneously avoiding micro-managing. Importantly, the managers and leadership need to actively encourage organization-level and employee-personal learning, and be accepting and reflective of failure, rather than judgmental. Long-term strategy is unequivocally one of the most important factors in aligning a mature SME's innovation capabilities, and a current problem at all of the researched firms. They need a clear, written company vision and mission to align all the employees' goals towards the long-term success of the company. A business strategy must accompany this vision and mission, and must not solely focus on the financial goals of the company, a mistake that these mature SMEs tend to make. Also related to their strategy and vision is that they must ensure that there is awareness among managers of the external agreements and collaborations the companies are involved in, and that strategy-building is not limited to within their current niche.

With these conclusions in mind, a conceptual model was designed that summarizes the understanding gained from this study of how an established SME can improve its innovation capabilities on an abstract level.

One can certainly reflect on improvements that could have been made to this study to increase the quality and reliability of the results. For one, speaking mainly to managers may have biased the results towards their perspective and view on the firm, so an obvious improvement would have been to interview more developers, factory workers, etc., had there been time. Following the discussion on validity in the methodology chapter, the investigation certainly captures the intended aspects: the areas for improvement in the three SMEs. The results are therefore highly valid in the context of the three studied firms. Because of the simple nature of our conceptual model, its generalizability is likely significantly higher than the specific issues found to be common at the three studied companies. The model is meant to be used in the context of long-established SMEs to understand how their organizational resources and capabilities affect their capacity for innovation. Naturally, the statement about

the model's ability to be applied on other companies than those studied leads us to the discussion of further research. The conceptual model would benefit greatly from being tested for applicability on other companies of the intended type, ideally through a large-scale study to complement the small-scale, in-depth case study done in this project.

In conclusion, this project has contributed with a detailed perspective on niche-technology, long-established SMEs and an abstract understanding of their innovation capability improvement opportunities, which, being in an area not covered well by existing literature, will hopefully be of use to future scholars in innovation management research.

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A

Interview Template

The interview template used, including a list of topics discussed and questions asked, when interviewing the Factory Manager at Company C.

- **Introduction questions:**
  - *Can you tell us a bit about yourself?*
  - *How long have you been working at Company C?*
  - *What have you done before you started at Company C?*
  - *What do you do in your role as the head of production and purchasing?*
  - *What kinds of responsibilities do you have and what would a regular day look like for you?*
  - *Who are you responsible for? What specific roles do they have?*
  - *Do you have any other "unofficial" roles in the company?*
  - *What are your long-term goals? What is your vision for your own work or your own projects? How do you measure if you've done a good job? What makes you happy at the end of the day knowing you've achieved that goal?*
- **Cultural questions:**
  - *How would you describe Company C's company culture?*
  - *Do you have any incentives at Company C to increase employee motivation?*
  - *Do you have any reward systems or similar?*
  - *Do you have any team building or team activities on a "regular" basis to*

improve how you work as a team?

- *Are there any differences between the culture in the Production & Purchasing team vs. the rest of the company?*
- *We heard that occasionally the salespeople come to the factory to show customers your products and to learn more about them. Can you tell us a little bit about how these visits go?*
- *Do you ever travel to the "headquarters" to learn from the employees there?*
- *Does Company C have any fixed, stated vision or mission (reflected in your everyday work)?*
- *Are you able to stay updated on Company C's current state and future plans?*

- **Organizational questions:**
  - *We've seen that the Production & Purchasing department has you and a number of other managers in it, but can you describe in more detail their roles and responsibilities, and if there are any other people in the department (e.g. production personnel)?*
  - *With you working at a separate location from the "headquarters", how does the communication work with the rest of Company C? How is it done?*
  - *What do you discuss and collaborate on?*
  - *What do you think about the communication? Have there been issues or challenges?*
  - *Is it always clear who you should contact when an issue or idea comes up?*
  - *How involved are you with the people on the "factory floor"? What kinds of issues do you face with them?*
  - *How would you describe the communication between your employees and the company's managers?*
  - *How pleased are they with the company? Does Company C have ways to motivate them to do a good job?*

- **Supplier questions:**

  - *Who are your suppliers? What components or materials do they supply?*
  - *How do you communicate with your suppliers?*
  - *Do you have good contact with them? What kinds of information/knowledge do you share/exchange with them?*
  - *Is there a lot of trust in this relationship?*
  - *How fast is the procurement process? If e.g. the Product team wants to try out some new technologies, how can the Production & Purchasing team get a hold of those in the fastest time possible?*
  - *Do miscommunications ever happen (e.g. incorrect orders?) If so, how have you dealt with those? Are there any areas for improvement you have noticed?*

- **Innovation questions:**
  - *What is your opinion on innovation in general? What comes to mind when you think of innovation and working with innovation? What is your attitude towards innovation? What is your philosophy on how to become innovative?*
  - *Do you think the rest of your colleagues and the company think the same way?*
  - *Do you feel that you are at all involved in Company C's innovation process?*
  - *Do you feel that your department or the factory helps in Company C's innovation process?*
  - *We heard from the Head of Product Development that you've been trying to do some collaborations with universities in your area. Has this worked out well? In what areas (or: for what purposes) do you want to have these collaborations?*
  - *We've heard that when Company C is working on a new product, it will often bring in experts from outside the company to help work on a new technology, new material, etc. Do you do any testing, or this kind of R&D, in-house?*
  - *You clearly have an advanced method for testing the reliability of your installed products, and must receive a lot of data from this. Do you use this data when creating new products? I.e. are you able to use current product data in the development of new products?*

  - *Has Company C ever made major changes or improvements (organizational innovations) regarding e.g. the manufacturing process or other things that have led to a better quality workflow or product?*

  - *Do you work with any specific methods or frameworks, e.g. Lean, SIGMA, etc.?*

- **Idea questions:**

  - *Do you, or your team/department, ever come up with new ideas for e.g. products or processes? If so, what do you do with these ideas? How are they evaluated?*

  - *Do you ever receive any information or ideas from suppliers that could help you in your innovation process (e.g. new technologies)?*

  - *How do you start acting on a chosen idea?*

  - *How flexible is the organization for new ideas?*

  - *Can the organization handle multiple (NPD) tasks at one time or does the development of a new product or the emergence of a new problem affect unrelated work in the company (negatively)?*

  - *We guess you have a lot of experience in seeing how new products are taken into production. How does this process work?*

  - *What kinds of challenges and problems have arisen in that process?*

  - *To what extent do the new innovation projects "need" to suit your existing operations? Do you have any processes for adding new knowledge, technologies, etc. needed for the new innovation?)*

- **Concluding questions:**

  - *Do you have anything that you would like to add?*

  - *Who do you think it would be most valuable for us to talk to next? What other people or departments work directly (or indirectly–for future interviews) with innovation?*

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
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