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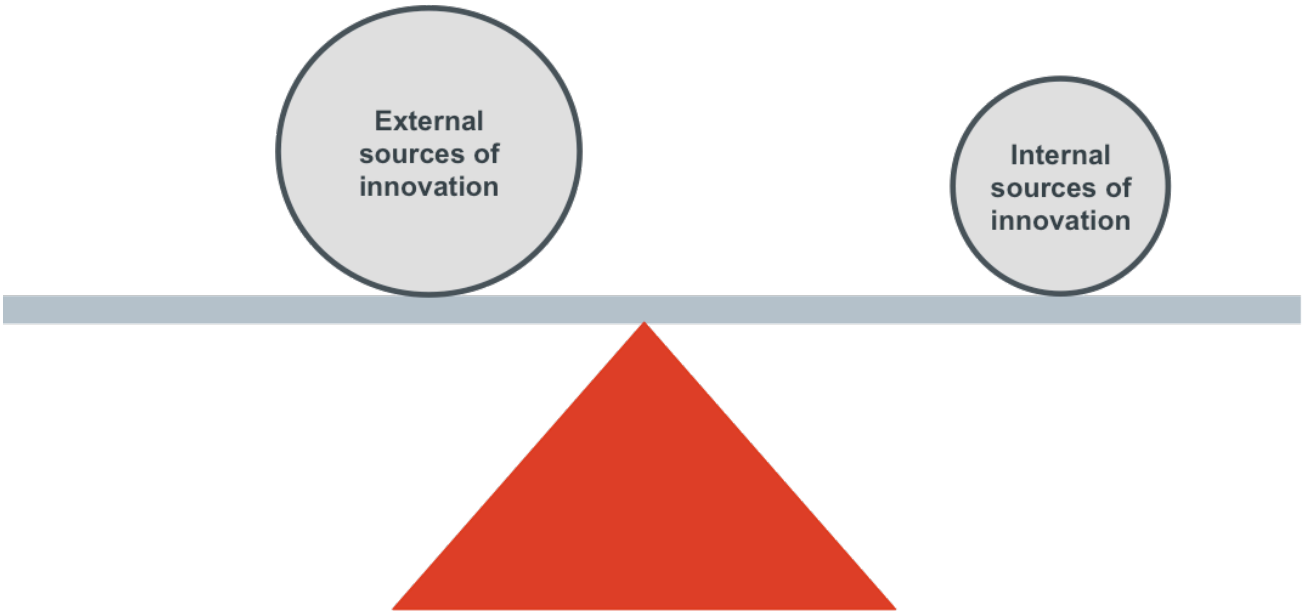

Capturing Supplier Innovation at a Manufacturing Company

An analysis of how a firm can facilitate the use of external sources of innovation

Master's Thesis in the Master's Program
Management of Economics and Innovation

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Cover:
Finding the balance between the uses of internal versus external sources of innovation.
More about this in section 5.7 in the report

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Abstract

The increasing speed of technology advancements is placing higher requirements on effective R&D capabilities and many industries have lately seen a shift with respect to the dominant innovation strategy. A closed innovation strategy, in which R&D activities are kept in-house, has lost ground in favor of a more open innovation strategy with emphasis on capturing value from employing external sources of innovation. While some industries, such as the automotive industry, have already come far with their transition, other industries are still ruled under a more closed innovation regime. Many companies in these, with regards to sources of innovation, more conservative industries want to become better at leveraging external sources of innovation but struggle to do so. One of these companies is Company X, a leading actor in the industrial machinery industry, which is currently facing many of the challenges associated with the transition from a closed to an open innovation strategy.

The purpose of this thesis was therefore to analyze how Company X can become better at facilitating the use of external sources of innovation, with distinctive, but not exclusive, focus on suppliers as a source.

Semi-structured interviews with company employees as well as suppliers and company specific documents have been the basis of the data collection. The data was thereafter compiled and analyzed using a systematic approach with a 1st and 2nd order analysis. The literature review was partly used to gain better insight on the subject of matter and the processes at Company X, and partly to inspire potential solutions and recommendations. Based on the analysis of the empirical findings and theoretical framework, recommendations specifically tailored for Company X were formulated and lastly the research questions were answered.

The result of the thesis was that although Company X has incorporated parts of the principles behind open innovation they are still much colored by their heritage. Internal resistance, diverging perceptions of innovation, lack of formalized evaluation processes and too much emphasis on existing sources of innovation were identified as the main hinders for Company X moving forward. Company X is therefore recommended to implement ways to overcome the internal resistance and align how employees perceive effective innovation management. Moreover, a new evaluation process, new ways to discover and classify innovative suppliers and alternative sources of innovation are proposed. Although explicitly tailored for Company X, part of the recommendations and conclusions are considered applicable to other, similar, companies as well, which is why this thesis could be of interest for readers beyond that of employees from Company X.

Preface and acknowledgments

This Master's Thesis has been conducted during the spring semester of 2017 as a part of the master's program Management and Economics of Innovation (MEI) at Chalmers University of Technology. The thesis was conducted in collaboration with Company X, a global industrial machinery manufacturer with Swedish head office in Småland.

First, we would like to express our gratitude to Company X for providing this opportunity and specifically to our supervisor at the company and the manager that trusted us with this task. You know who you are. Furthermore, we would like to thank all of the interviewees that took their time to meet with us and answer our questions and provide highly valued insights.

Finally, we would like to thank Sara Fallahi, our supervisor at Chalmers University of Technology, for her support, insights, time and the laughter we shared that always kept us moving forward throughout the whole process.

Glossary

SRM = Supplier Relationship Manager

SD = Supplier Development

CCH = Counterbalanced container handler

FLT = Forklift

TT = Terminal Tractor

BL = Business Line (FLT, TT & CCH)

PL = Product Line (FLT Light, Medium, Heavy etc)

MEQ = Mobile Equipment division

MAU = Manufacturing Assembly Unit

NPD = New Product Development

ESI = Early Supplier Involvement

PPM = Product Portfolio Meeting

IA = Innovation Agent

IAM = Innovation Agent Meeting

Table of contents

1 Introduction 1
1.1 Background 1
1.2 Problem formulation 2
1.3 Purpose 3
1.4 Research questions 3
1.5 Thesis disposition 3
2 Literature review 4
2.1 The shift from closed to open innovation 4
2.2 Obtaining innovation from external sources 6
2.2.1 Internalizing the knowledge 7
2.2.2 Designated contracting 8
2.2.3 Crowdsourcing 8
2.2.4 Internal, designated contracting or crowdsourcing 12
2.3 Leveraging innovation, why supplier integration matters 13
2.3.1 Managing the costs of integration by effective coordination 16
2.4 Using supplier innovation as a source for competitive advantage 16
2.5 Explanatory synthesis of the chosen literature 17
3 Methodology 18
3.1 Research design and method 18
3.2 Data Collection 19
3.2.1. Interviews 20
3.2.2 Observations 21
3.2.3 Literature collection 21
3.3 Data Analysis 22
3.4 Quality Rigor 22
4 Empirical findings 24
4.1 Company X's organization and governance 24
4.1.1 R&D 25
4.1.2 Sourcing 25
4.1.3 Sales 26
4.2 Main findings from interviews with Company X employees 26
4.2.1 Emphasis on extended supplier relationship building 26
4.2.2 Leveraging suppliers in the development process 28
4.2.3 Managing the need for innovation 30
4.2.4 Sources of ideas and idea evaluation 32

4.3 Main findings from interviews with suppliers 35
5 Analysis 39
5.1 Distinctive emphasis on lack of innovation efforts 39
5.2 No strangers to open innovation but heritage shines through 40
5.3 New initiatives do not facilitate discovery of new suppliers 42
5.4 Unilateral focus risks overshadowing potential sources of innovation 43
5.5 Unstructured evaluation process leaves room for avoidable mistakes 45
5.6 Cost focus over extended relationship building 46
5.7 More does not always equal better 48
6 Recommendation 50
6.1 Embracing external sources of innovation 50
6.2 Strengthened process of discovering new suppliers 51
6.3 Shift to a multilateral focus for additional sources of innovation 52
6.4 Have a semi-structured and front end focused evaluation process 53
6.5 Long-term cost consciousness instead of short-term price cuts 54
6.6 There is no value in excess 55
7 Conclusions 56
8 Implications for future research 58
9 References 59
10 Appendix 64
10.1 Interview templates 64
10.2 Documentation of statements 74
10.3 1st- and 2nd-order analysis 85
10.3.1 1st- order aggregation 86
10.3.2 2nd - order analysis 94
10.3.3 Results 96

1 Introduction

In this introductory chapter the setting and the purpose of the thesis will be stated. The chapter is divided into four subchapters. First a background of the field of research will be presented, thereafter follows the problem formulation and the purpose. Thereafter the three research questions are stated. Lastly the thesis disposition, summarizing the content of the thesis, is outlined.

1.1 Background

"In today's world, where the only constant is change, the task of managing innovation is vital for companies of every size in every industry" – Henry Chesbrough

Throughout the 20th century much of the technological innovations that companies introduced were attributed to large, in-house, R&D departments (Chandler, 1977). However in its traces a more open approach emerged that embraced the thought of external sources of innovation (Chesbrough, 2003). Enriching a company's own knowledge base through integration of suppliers, customers and other external sources of knowledge has been shown to increase innovativeness (Laursen and Salter, 2006). Among these external sources of innovation customers seems to be the dominating source, closely followed by suppliers and competitors (Enkel and Gassmann, 2008). Companies from other industries, be it suppliers, are however identified as a particularly important source of innovation since most innovations are based on the recombination of existing technologies, concepts and knowledge rather than the invention of something radically new (Galunic and Rodan, 1998; Khilji et al., 2006, Enkel et. al, 2009). This notion is supported by Schiele (2012) who describes the role of suppliers in the innovation process as something that companies are increasingly employing to nurture technological advancements. In an attempt to explain how companies can benefit from the use of external sources of innovation West and Bogers (2014) emphasize that utilizing external sources of innovation is much more than simply obtaining them. Integration of said innovations into the internal R&D department, whilst at the same time making sure that the company profits from the innovation, is crucial.

Moreover, an increased inflow of ideas put greater emphasis on an effective process of evaluating external sources of innovation to ensure its viability, which may alter the responsibilities of certain roles within a company (West and Bogers, 2014; Ettlie and Elsenbach, 2007). Moreover, when it comes to successfully leveraging external sources of innovation, the automotive industry has come far in comparison to other industries (Clark and Fujimoto, 1991) and could thus serve as a benchmark for companies in more conservative industries. The automotive industry could act as a guide towards a more successful innovation process, avoiding pitfalls as for example over extending the balance between internal and external sources of innovation. An industry that often benchmarks itself towards the automotive industry and is similar in many ways is the one in which Company X is operating, the industry for industrial machinery.

With over 5000 employees around the world, and an offering covering customer needs in a variety of different industries, Company X is one of the leading actors in the industrial machinery industry. The industrial machinery industry is characterized by technically complex products, government regulations and ever changing customer requirements, which is why keeping up to date with the latest technology advancements has become paramount for survival. The entry barriers are high due to large capital investments and consequently, a few big actors, in fierce competition with each other, have dominated the industry over the years,

with Company X historically being the main driver of new technology among these. Open innovation is not an unknown phenomenon in the industrial machinery industry, but in contrast to the automotive industry, many of the companies are still doing much of the development on their own, and Company X is no exception. Applying the logic of open innovation on this more conservative industry becomes particularly interesting due to the fact that many actors want to leverage more external sources of innovation. Even though there are best practices that can be applied the majority of companies in this industry are still ruled under a more closed innovation regime, as outlined by Chesbrough (2003). To why this is the case there's no definite answer, but studying Company X could, in addition to identifying feasible measures for Company X to take, shed some light on the challenges that industrial machinery companies face when transitioning into a more open innovation strategy.

Company X is divided into five different business units, which all operate under their own regime. The biggest of the five is called mobile equipment (MEQ) and is the division that will be analyzed in this thesis. Therefore, from now on, the term Company X will be used in place of MEQ and everything that is described in this thesis will reflect what is true for MEQ. Moreover, Company X has a long heritage of doing everything on their own but has over the last decade moved more or less all of the manufacturing to suppliers and could today be described as more of an assembler of pre-manufactured components than a manufacturer. However what, at large, still remains in-house is the R&D activities for new products and its components. In other words, even though more or less all of the components are manufactured outside of the company, much of the design work is still performed by in-house R&D personnel.

With much of the development still kept in-house, Company X has lately begun to embrace some of the principles of open innovation as outlined by Chesbrough (2003). This new way of thinking about innovation has come as a response to the increasing speed to which new technologies emerge, since some parts of Company X is much aware of the new set of challenges this rate of change brings. Moreover, it is evident that Company X has stumbled across some of the most common challenges associated with a more open innovation approach: where to look for new ideas, in what way to integrate them and how to commercialize on external sources of innovation (West and Bogers, 2014). The need to adapt their internal innovation management processes to overcome these challenges is reflected in how employees all across Company X perceive current innovation efforts. Although the specifics differ, there is consensus in the attitude towards current innovation efforts not being sufficient to stay on top.

1.2 Problem formulation

In line with West and Bogers' (2014) view on how companies can benefit from external sources of innovation, Company X has several different issues to consider when transitioning towards a more open innovation approach. First, Company X would need to consider what their external sources of innovations are/ought to be and how they should best facilitate obtaining innovations from these. Even though Company X has a well developed R&D process, which successfully incorporates customers' requirements, there is a concern that other sources are underutilized or not leveraged at all. Since Company X has a large supplier base specifically using suppliers, as a source of innovation, has been emphasized by the management board. Due to the nature of Company X's outsourcing strategy, assembling pre-manufactured components rather than manufacturing on their own, suppliers are considered to be the most accessible source to benefit from, but other sources, such as individuals from the crowd or universities, have also surfaced as possible extensions of the internal R&D

capabilities. Next, Company X faces the challenge of integrating said external sources of innovation into their internal R&D process and day-to-day business (West and Bogers, 2014) without risking the negative consequences, such as overstepping the balance of internal vs. external sources, of doing so (Bruce et. al, 1995). Here, Laursen and Salter (2006) underline the importance of dealing with the "not invented here" mentality, meaning that ideas are rejected simply because they came from outside the company, that is often found within large companies' R&D departments. Moreover, an innovation is not considered an innovation unless it reaches commercial viability (Baregheh et al., 2009), which is why the evaluation process is of great importance, not only for internal innovations but perhaps even more, for innovations stemming from external sources (Dogson et al., 2006). For Company X, concern from the management board has emerged over good ideas getting lost due to lack of formal responsibilities at the early stages of the evaluation process. Therefore learning how their current operations align with what is described as optimal to facilitate open innovation, and understand what they can do differently to better prepare themselves for the future, are of great importance for Company X.

Finally, the issues with capturing, integrating and commercializing on supplier innovations are not considered to be unique for Company X, which is why the results of this thesis is believed to be somewhat generalizable to other, similar, companies. However the purpose of this thesis is not to provide general guidelines for the field as such but rather provide more specifically tailored recommendation for Company X. Moreover, since an open innovation strategy is in its early stages at Company X the recommendation will have some concrete advices but it will also look at the processes on a more general level.

1.3 Purpose

The purpose of this thesis is to investigate how Company X could become better at facilitating the use of external sources of innovation with a distinctive, but not exclusive, emphasis on suppliers.

1.4 Research questions

1. What are the current processes for capturing supplier innovation at Company X?
2. How can Company X better leverage suppliers as a source of innovation?
3. How can Company X improve their methods for using external sources of innovation beyond that of suppliers?

1.5 Thesis disposition

This master thesis comprises 7 different chapters. Chapter 1, introduced above, outlines the background of the research field and some initial facts about Company X. In Chapter 2, current literature on open innovation, and the possible role of the supplier in this context, will be presented. Chapter 3 includes a thorough description of how the research questions were approached and answered. Furthermore, in Chapter 4 the empirical findings are presented using descriptive headlines, derived from the main findings, comprising several interview under one storyline. Chapter 5 is the analysis. built on the logic of action titles, see Appendix 10.3 for further explanation, which illustrates the main problems at Company X. Chapter 6 consist of the recommendations proposed to Company X and is structured in accordance with the action titles from Chapter 5. Moreover, in Chapter 7, the answers to the research questions are presented. Lastly, in Chapter 8, implications for future research are discussed. Following chapters are supporting parts, so in Chapter 9 and 10, References and the Appendix can be found.

2 Literature review

In this chapter a background of prior research within the field of open innovation will be presented. The main objective is to provide the reader with an overall understanding of the subject as well as a more tailored insight to the supplier's role in innovation activities. The chapter will be based on the main themes obtaining, integrating, and commercializing on innovation. Firstly, however, a summary of the transition from closed to open innovation as described in literature will be presented.

2.1 The shift from closed to open innovation

Back in 1943 Schumpeter (1943) argued that capitalism is an evolutionary process which requires innovation and creative destruction. Schumpeter (1943) stated that innovation is the engine of all economic change and the temporary monopoly it creates is central to incentivize firms to develop new products and processes. Today there are several different definitions on what innovation really means (West and Bogers, 2014). Some use knowledge and innovation interchangeably while others make a clear distinction stating that knowledge alone does not create innovation (Galunic and Rodan, 1998; Khilji et al., 2006). Instead they argue that innovation occurs when the recombination of existing knowledge creates commercially valuable products or processes. This definition goes well in hand with the definition of innovation proposed by Baregheh et al. (2009) stating that innovation is:

"Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace."

Moreover, even though most business leaders agree that continuous innovation is a necessity for the success of the company, evidence shows that innovation activities in many industries are not yielding sufficient results (Linder et al., 2003). An increasing amount of resources invested by companies in R&D and the many sophisticated corporate research facilities that exist today are witnesses to the increased awareness of the importance of innovation, yet many of these same companies fail to keep up with technology trends and consequently have to see themselves be overtaken by others (Chesbrough, 2003). During most of the twentieth century the most commonly used R&D practice was to invest heavily in internal R&D capabilities, a strategy that yielded great results and many new discoveries (Chesbrough, 2003, Enkel et. al, 2009). Chesbrough (2003) defines this type of innovation strategy as Closed Innovation. The Closed Innovation strategy centers around keeping R&D activities in-house, from idea generation until it is shipped to customer, and is designed to filter out false negatives, ideas that might look appealing at first but later turn out to be of no real use (Chesbrough, 2003).

We should hire the best and the brightest people, so that the smartest people in our industry for work us
In order to bring new products and services to the market, we must discover and develop them ourselves
The company that gets an innovation to market first will usually win
If we lead the industry in making investments in R&D, we will discover the best and the most ideas and will come to lead the market as well
We should control our intellectual property, so that our competitors don't profit from our ideas

Table 2.1 Five principles of closed innovation (Chesbrough, 2003)

However, the increasing mobility of experienced people, the extensive knowledge spill out from universities, more knowledgeable customers and suppliers, increased need for fast time to market and the growing presence of venture capitalist are all reasons to which why the closed innovation strategy has become somewhat obsolete, and are thus referred to as the "eroding factors" (Chesbrough, 2003). As a consequence, a new paradigm of innovation strategy has emerged, Open Innovation. Open Innovation builds on the logic that companies can, and should, take advantage of both external as well as internal sources of ideas, and alternative paths to market, when making technology advancements (Chesbrough, 2003). Open Innovation builds on a different set of principles, see Table 2.2.

Not all smart people work for us. We need to work with smart people inside and outside our company.
External R&D can create significant value; internal R&D is needed to claim some portion of that value
We don't have to originate the research to profit from it
Building a better business model is better than getting to market first
If we make the best use of internal and external ideas, we will win.
We should profit from other's use of our IP, and we should buy others' IP whenever it advances our own business model

Table 2.2 Six principles of open innovation (Chesbrough, 2003)

As seen in Figure 2.1, the Open Innovation model emphasizes both ideas that are generated within the firm and ideas that are brought in externally, and suggests some very different organizational principles for research and innovation.

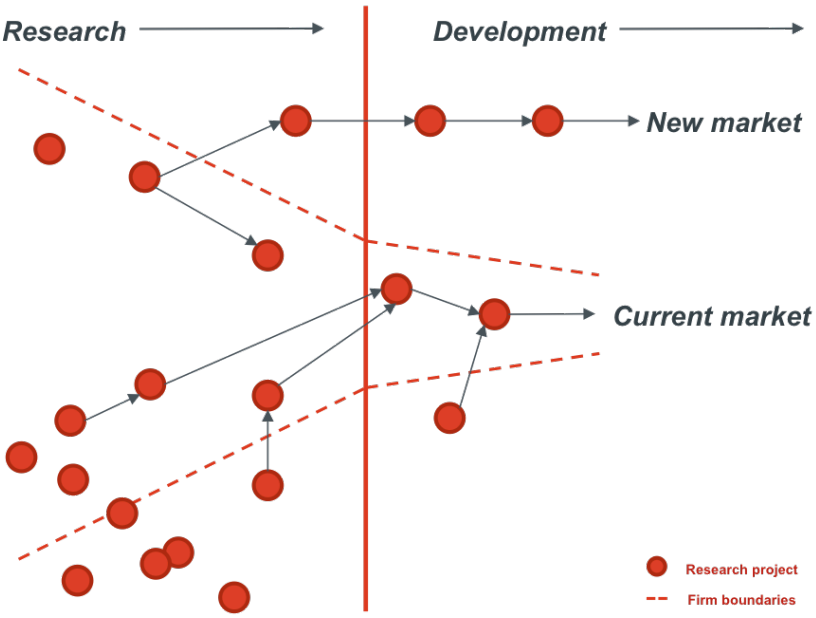

Figure 2.1 Illustration of open innovation process (Chesbrough, 2003)

While some industries have not been severely impacted by the eroding factors and are still operating under the Closed Innovation regime, the emergence of a new, more open, approach

to innovation is evident in how many other companies are increasingly looking outside of their boundaries, utilizing customers, research companies, business partners and universities, to nurture innovation (Chesbrough, 2003; Linder et al., 2003).

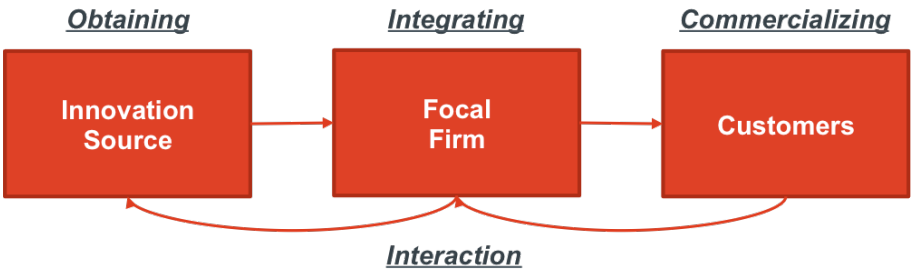

Figure 2.2 A four phase model on open innovation (West and Bogers, 2014)

West and Bogers (2014) describe open innovation as a four phase model, see Figure 2.2. Their model suggests that there are three major steps illustrating a linear process going from external idea generation to delivering value to the customer. These three steps are Obtaining, Integrating and Commercializing. Added to these three steps are the interaction mechanisms which can occur between any of the stages. This interaction step illustrates the bidirectional flow and other processes which goes beyond a completely linear model. Also, apart from the external sources highlighted by Chesbrough (2003) and Linder et al. (2003), West and Bogers (2014) also emphasize individuals from the crowd, basically anyone anywhere, as an external source of innovation.

Furthermore, West and Bogers (2014) raise a warning finger for obtaining too much innovation from external over internal sources due to diminishing returns in terms of innovation performance and rising costs. Lastly, in the search for external sources of innovation not only the characteristics of the external source itself determines successful use of external innovation, but internal factors such as R&D capabilities and complementary assets also play a key role (West and Bogers, 2014).
The rest of this literature review will be loosely based on the model of West and Bogers (2014) since it illustrates fundamental aspects of leveraging external sources of innovation. Thus the red thread will follow the phases of obtaining, integrating and commercializing innovation. In addition, literature more specifically tailored for the research question and the case will be presented to give a more comprehensive and in-depth understanding of prior and current research.

2.2 Obtaining innovation from external sources

The first step in West and Bogers (2014) model, obtaining innovation from external sources, emphasizes how companies must first know how and where to search for external sources of innovation. Vega et al. (2015) defines this process as a search in two dimensions where the search can either be local or distant. Afuah and Tucci (2012) support the notion of two different ways of searching and argue that when the knowledge required to solve a task can be found internally within the company or in the company's immediate surroundings, a local search is conducted. In contrast, a task that requires knowledge in an area where the company has no or poor prior knowledge, calls for a distant search. In a local search the company looks for new knowledge that builds on their existing knowledge, which may decrease the probability to find novel solutions but instead increases the chance to find a solution that is workable (Fleming and Sorenson, 2004; Rosenkopf and Nerkar, 2001). A distant search on

the other hand, stresses recombination of knowledge which could increase the probability to identify innovations that can give a competitive edge.

Moreover, Afuah and Tucci (2012) describe the process of using a local or distant search as methods to solve problems specific to the company, rather than defining it as a task. However, the nature of these problems could be anything from problems with very detailed specification requirements to widely open ideation problems without hardly any requirements at all. When a company needs to look outside of their immediate surroundings for knowledge to solve a particular problem, i.e. a distant search, Afuah and Tucci (2012) argue that they can choose to employ three different methods: (1) the company tries to obtain and internalize all required knowledge; (2) the company uses designated contracting; or (3) the company employs crowdsourcing methods, see Figure 2.3.

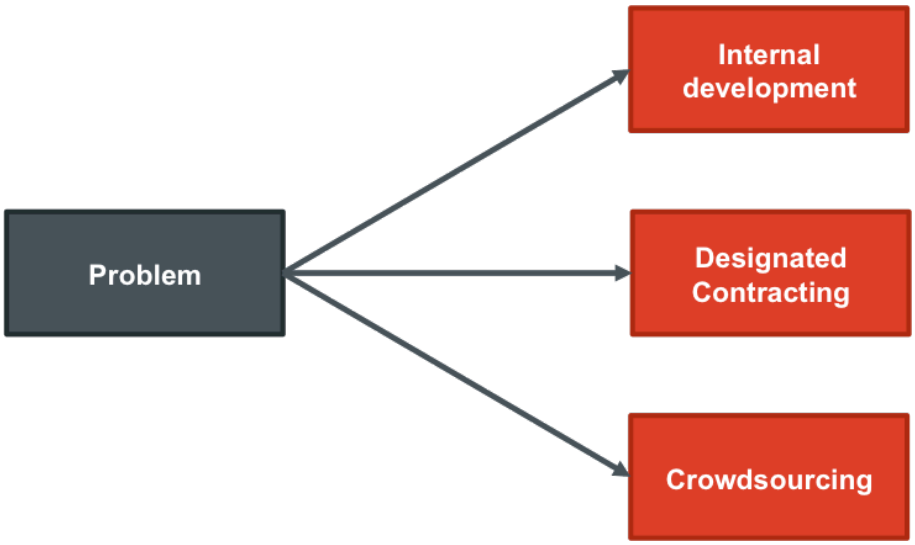

Figure 2.3 Three methods for solving a problem, based on the work by Afuah and Tucci (2012)

2.2.1 Internalizing the knowledge

Although companies are relatively well-coordinated entities with specialized knowledge and processes to address different problems and innovation opportunities (Boudreau & Lakhani, 2013), obtaining knowledge and learning anew is associated with several hurdles (Afuah & Tucci, 2012). A company is, on its own, limited in its ability to access, process and/or store information and faces constraints on the number and type of alternatives it can manage on its own. Moreover, internalizing complex knowledge through learning anew can be, and often is, subject to high costs.

To overcome some of the hurdles, the company hold the possibility to simply acquire a suitable technology or try to acquire the firm itself and incorporate it into the company's own organization (Ceccagnoli et al., 2010). Although acquiring a company or technology upfront can be effective, it will still have implications with regards to successfully integrating either the new technology into the R&D organization or the acquired company into the organization as whole.

2.2.2 Designated contracting

Instead of trying to acquire the knowledge on their own a company can choose to outsource the problem to a contractor, which is referred to as designated contracting (Afuah and Tucci, 2012). When employing designated contracting the company that seeks a solution evaluates each potential contractor on the basis of their ability to deliver the desired solution and then picks the one that is considered to best meet the requirements. These contractors are often existing suppliers of the company, but could nevertheless be new suppliers as well as other entities, e.g. universities. Using suppliers in such a way is recognized by Henke & Zhang (2010) as a method with particularly large innovation potential due to the suppliers, often broad, knowledge about customers' operations. A claim that is supported by Brem & Tidd's (2012) argument that suppliers possess, perhaps even more than the customers themselves, great insight about a customer's products and processes. Afuah & Tucci (2012) further reinforces the innovative role of suppliers by stressing the need for companies to, under certain circumstances, extend their scope in the search for efficient problem solving and addresses the importance of knowing when and when not to employ external sources of innovation. In the context of innovation, suppliers can be involved in various stages of a customer's products' life cycle, from the earliest design phases to commercialization and aftermarkets (Henke & Zhang, 2010) and the way that suppliers are used can come in different forms (Afuah & Tucci, 2009).

However, successfully evaluating a candidate to select for designated contracting purposes not only means finding potential candidates but also requires the company to have the absorptive capacity, the ability to recognize the relevance of new information, needed to evaluate their abilities (Cohen & Levinthal, 1990). In other words, the seeking company needs to have prior knowledge in a certain field to be able to evaluate potential contractors in that particular field. If the company does not possess that prior knowledge, successfully evaluating potential candidates would mean performing two different distant searches. More specifically, first the company would need to acquire the right knowledge to know what abilities of the candidate to appreciate, and then evaluate different candidates based on this knowledge (Afuah & Tucci, 2012).

2.2.3 Crowdsourcing

The third alternative that Afuah and Tucci (2012) propose is the method of crowdsourcing, the act of releasing a problem for the crowd to solve, a strategy that has lately been increasingly used to answer puzzling research and innovation problems (Afuah and Tucci, 2012; Boudreau and Lakhani, 2013). The definition of crowdsourcing has been frequently debated ever since Howe (2006) coined the expression. In most literature, the contributors in crowdsourcing have been interpreted as a vast, undefined, mass of individuals somewhere on earth that is reached out to through an internet based platform (Estellés-Arolas and González-Ladrón-de-Guevara, 2012; Brabham, 2008). Simula and Vuori (2012) have another take and argue that with regards to B2B firms, crowdsourcing can take four different forms: Internal crowdsourcing with employees, crowdsourcing with trusted partners, crowdsourcing with pre-qualified participants or with a community and crowdsourcing with the general crowd. The second form, crowdsourcing with trusted partners, is in particular different from much of the other literature on the subject and raises the notion that entities, such as suppliers, business partners etc, can be subject to crowdsourcing as well. This is particularly true for crowdsourcing methods such as innovation contests in which both firms and individuals can participate as solvers. However, regardless of how the crowd itself is defined, Brabham (2008) states that an idea or solution must be acquired, implemented, fabricated, and sold, for it to be called crowdsourcing.

The applications of crowdsourcing is extensive and the method can be used for problems with simple, complex, or creative nature (Schenk and Guittard, 2009). In contrast to designated contracting, crowdsourcing does not require the company to beforehand evaluate a set of potential candidates but instead opens up the opportunity to attract candidates that, themselves, only have to perform a local search to solve the problem. On the other hand, crowdsourcing will merely move the problem from evaluating the ability of the candidate to evaluating the performance of the solution, which, in the same way as with designated contracting, will lead to a distant search to acquire the right knowledge to do so (Afuah and Tucci, 2012).

Moreover, despite a growing list of successful cases, some business managers still remain cautious and few companies have effectively adopted crowdsourcing. The idea of turning to a large group of strangers to solve a particular problem is often perceived as risky, in particular for companies that historically have relied much on their internal R&D capabilities and are worried about the intellectual property rights. To bypass the inconveniences with crowdsourcing, many companies around the world are using internal, crowd-like approaches to creativity such as jams, idea marketplace and personal entrepreneurial projects to increase the scope and flexibility of their innovation activities. Although these activities have proved to be successful for some, they still fall short of the full capacity of crowdsourcing (Boudreau & Lakhani, 2013). However, the business managers suspicion towards crowdsourcing is not ill-founded since crowdsourcing is far from the solution to all problems and its usefulness fundamentally depends on the nature of the problem that needs to be solved (Boudreau and Lakhani, 2013; Afuah and Tucci, 2012; Terwiesch and Xu, 2008). What is clear though, is that excluding crowdsourcing from the innovation toolkit means losing an opportunity for new ideas (Boudreau & Lakhani, 2013).

If the facts point towards crowdsourcing being the most prosperous option the company must, as there are numerous different possibilities, figure out how to work with the crowd to best reach the desired outcome (Boudreau & Lakhani, 2013). There is also the question whether the company itself should facilitate the crowdsourcing or if an intermediary should be used instead (Boudreau & Lakhani, 2013; Afuah & Tucci, 2012). Conclusively, there are more things to consider than whether or not to pursue with crowdsourcing, issues that will be discussed more thoroughly in subchapter 2.2.3.1

2.2.3.1 Understanding which form of crowdsourcing to employ

Boudreau & Lakhani (2013) argue that although there are many different possibilities. crowdsourcing generally takes one of four distinctive forms: (1) contests; (2) collaborative communities (3) complementor or (4) labor market. Each of the different forms display different characteristics and are more suitable than others depending on the situation and the nature of the problem (Boudreau & Lakhani, 2013). Whereas (1) contest and (4) labor markets are considered relevant for the purpose of this thesis and will be treated in this chapter.

Innovation Contests

The most commonly used and most straightforward way to engage a crowd is to create a contest centered around solving a particular problem, often called an *innovation contest* (Boudreau & Lakhani, 2013; Terwiesch & Xu, 2008). In an innovation contest, the firm (the seeker) presents the problem it is hoping to get solved to a group of independent agents (the solvers) and then provides an award to the agent that comes up with the best solution

(Terwiesch & Xu, 2008). Moreover, even though innovation contest primarily focus on the crowd for solutions, Terwiesch and Ulrich (2009) emphasize that an innovation contest can be open for anyone to solve, be it individuals or firms. Regardless, Terwiesch & Xu (2008) states that the seeker has more or less five factors to consider with regards to initiating an innovation contest: (1) the characteristics of the problem to be solved (2) how to facilitate the contest; (3) the number of participating solvers (4) the award allocation structure and (5) whether to use a free-entry or paid-entry structure for the contest.
Terwiesch & Xu (2008) propose that the innovation problems firms are facing can be divided into three different categories: expertise-based projects, ideation projects and trial-and-error projects, see Table 2.3, which all display a different set of characteristics and act as the underlying for determining the four remaining factors.

The characteristics of the problem to be solved		
Project type	**Characteristics of the project**	**Action taken by solver**
Expertise-based project	Engineering tasks with no uncertainty in performance function (well-behaved solution landscape) Example: Modify an existing process design to fit a new production site	Invest effort to enhance the existing expertise
Ideation project	Innovative problems with no clear specification, leading to uncertainty in the performance function Example: Design next-generation binder	Invest effort to create the best possible solution
Trial-and-error project	Solutions to research problems with well-defined goals, yet highly rugged solution landscapes, creating uncertainty in how to improve a solution	Experiment by trying out many solutions and then picking the one with the highest performance

Table 2.3 Different project categories (Terwiesch and Xu, 2008)

To facilitate an innovation contest Terwiesch & Xu (2008) proposes two different options: (1) the seeker facilities the innovation contest through in-house resources; (2) the seeker employs a third party intermediary firm to handle the transactions between the seekers and the solvers. The latter option, the use of a intermediary firm, can offer several benefits: (a) it induces competition amongst solvers; (b) the seeker only pays for successful ideas; (c) the seeker gains access to a broader set of solvers and thus more expertise; (d) there exists an opportunity for cost savings (in comparison to in-house facilitation); (e) there is an increase in idea generation and testing (Terwiesch & Xu, 2008; Boudreau & Lakhani, 2013).

In addition to the categorization, the seeker also has to consider the number of participants that should be invited to the contest, which in combination with what award-structure to use have major implications on the outcome of the innovation contest (Terwiesch & Xu, 2008). Although an increased number of solvers trying to come up with the best solution to a problem initially sounds good it comes with some downsides. An increased number of participating solvers decreases the chance for each of the solvers to win the competition and receive the award, consequently the contest faces the risk of *underinvestment* in the effort of

the solvers due to the lower chance of winning (Terwiesch & Xu, 2008, Terwiesch and Ulrich, 2009). Closely correlated to the number of participants and the fourth factor the seeker has to consider is the award allocation structure, where the most commonly used is fixed-price, in which the seeker beforehand announces a specific amount to be awarded to the winner (Terwiesch & Xu, 2008). In contrast to the fixed-price structure Terwiesch & Xu (2008) introduces an alternative reward structure, the performance-contingent award. Here, instead of a fixed amount the solvers would be awarded with basis of the performance of their solution and hence incentivizing them not only to exert extra effort to win the competition but also to make the best solution possible to increase the size of the award (Terwiesch & Xu, 2008). The fifth and final factor is merely the choice of using a paid-entry structure, possibly ensuring that only serious solvers participate, or a free-entry structure which could potentially attract a larger number of solvers (Terwiesch & Xu, 2008).

For all types of problems, the intermediary facilitated contest is considered slightly more advantageous than the self-administered due to the factors mentioned previously in this chapter and in addition the benefit of enabling the seeker's identity to remain hidden as well as having a trustworthy third party to broker the intellectual property rights (Terwiesch & Xu, 2008). The use of an intermediary is, however, fundamentally dependent on the availability of an intermediary in the industry that the seeker is operating in (Terwiesch & Xu, 2008). It is also stated that a free-entry model is to prefer over a paid-entry model for all types of problems since it encourages more solvers to participate, something that is considered a benefit since the variety of possible solutions is mitigating the risk of underinvestment (Terwiesch & Xu, 2008). An argument that is supported by Boudreau & Lakhani (2013) who states that even though a contest will not necessarily yield a viable solution to implement immediately, it gives the seeker good insight about what technologies are currently on the market or are under development.

Both Terwiesch & Xu (2008) and Boudreau & Lakhani (2013) do however stress the severity of having the right incentive structure in place in order to motivate solvers to exert maximum efforts. For both ideation and trial-and-error projects a performance-contingent award allocation structure is to prefer over a fixed-price structure since exerting higher effort will not only lead to a higher probability of winning the contest, but also increases the amount awarded (Terwiesch & Xu, 2008). The benefits of the performance-contingent award structure is however subject to diminishing returns with the number of participating solvers, thus for large contests with many solvers the seeker can choose to employ either of the two award allocation structures while the performance-contingent is superior for smaller contests (Terwiesch & Xu, 2008). For expertise-based projects however, the choice of award allocation structure depends on the solvers endowed expertise, that is, a performance-contingent structure may deter solvers that predict their endowed expertise is not enough to win the competition from exerting maximum effort, even though they may in fact have sufficient expertise (Terwiesch & Xu, 2008). In contrast, solvers which do predict they have a high chance of winning will exert more effort with a performance-contingent structure, leaving the choice of award allocation structure somewhat unclear for expertise-based projects (Terwiesch & Xu, 2008).

Finally, Boudreau & Lakhani (2013) emphasize the importance of promoting the contest in a way that it induces stature and makes it appealing to sufficiently skilled participants. In addition, it cannot be stressed enough that it is paramount for the seeker to induce enough incentives for the solvers to exert maximum effort, be it through an attractive award or increased probability of winning through fewer allowed participating solvers as well as other incentivizing factors (Terwiesch & Xu, 2008).

Crowd Labor Markets

When contests offer crowds rewards for coming up with solutions to specific problems, crowd labor markets instead facilitate the contact between buyers and sellers of services (Boudreau & Lakhani, 2013). A crowd labor market is a platform not facilitated by the companies themselves but by third-party intermediaries and has the purpose of matching skills to a specific task rather than matching individuals to jobs within the company for long-term employment (Boudreau & Lakhani, 2013).

These crowd labor markets are best suited for when a company know what kind of solution they are looking for and have a good sense of what an appropriate solver looks like (Boudreau & Lakhani, 2013). This crowdsourcing method is particularly useful for standardized, repetitive, tasks but can nevertheless be used for more complex assignments as well, and gives the company increased flexibility and a greater variety and depth of skills (Boudreau & Lakhani, 2013). Moreover, the management challenges of using crowd labor markets are trivial in comparison to other crowdsourcing methods, such as innovation contests, and rarely consumes much of the company's resources (Boudreau & Lakhani, 2013). Therefore, crowd labor markets can be an efficient substitute if an, for example, innovation contest seems to cumbersome to manage (Boudreau & Lakhani, 2013). Boudreau & Lakhani (2013) suggest that a few number of employees at a company can manage a large number of individuals through using a crowd labor market and still reach the same productivity as if they were instead an increased number of internally employed individuals working on the task.

2.2.4 Internal, designated contracting or crowdsourcing

To clarify the ambiguity of which of the three strategies to use Afuah & Tucci (2012) suggest five factors the company, looking to get a specific task solved, must consider when making a decision about how to proceed with solving a particular problem: (1) the characteristics of the problem; (2) the characteristics of knowledge required for the solution; (3) the characteristics of the crowd; (4) the characteristics of solutions to be evaluated and of evaluators; (5) information technology characteristics. Table 2.4 depicts the findings from Afuah and Tucci's (2012) research on how the five factors impact the probability that a problem can be crowdsourced.

1. Characteristics of the problem	
The easier it is to delineate and transmit a problem (because its tacitness and complexity are low), the higher the probability the problem can be crowdsourced	The more modularizable a problem is, the higher the probability the problem or its components can be crowdsourced
2. Characteristics of knowledge required for the solution	
The larger the effective distance between the company's knowledge and the solution knowledge needed, the higher the probability the problem can be crowdsourced	The higher the tacitness and complexity of the solution knowledge that a company must acquire, the higher the probability the problem can be crowdsourced
3. Characteristics of the crowd	
The more pervasive the problem-solving know-how in a crowd, the higher the likelihood there will be someone in the crowd who will self-select to solve the problem, and therefore the higher the probability the problem can be crowdsourced	The greater the extent to which members of a crowd are more motivated to solve a problem, the higher the probability the problem can be crowdsourced
4. Characteristics of solution to be evaluated and evaluators	
The more experience-good oriented a solution, the higher the probability the problem can be crowdsourced	The more users that can evaluate a solution, the higher the probability the problem can be crowdsourced
5. Characteristics of IT	
The pervasiveness and low cost of IT positively moderate the relationship between the probability of crowdsourcing and the characteristics of the problem, the knowledge required for the solution, the crowd and the solutions to be evaluated	

Table 2.4 Five factor model (Afuah & Tucci, 2012)

Afuah & Tucci (2012) do, however, argue that some factors that favor crowdsourcing might also favor the option of using designated contracting, whereas some factors might solely favor one of the two. More specifically, a problem that is easy to delineate and transmit point towards both crowdsourcing and designated contracting being viable methods, while positive characteristics of the crowd naturally favors only crowdsourcing. Therefore, there is uncertainty whether one option is more favorable than another and there may be more factors, individual to each company that needs to be considered (Afuah & Tucci, 2012).

2.3 Leveraging innovation, why supplier integration matters

Identifying and attaining innovations using suppliers is not the final destination (West and Bogers, 2013). To transfer the idea to an actual implemented innovation requires the innovation to become integrated in the firm's own R&D activities. Here, the cultural and relationship aspects has been shown to be of great interest to achieve said integration.

In the past 40 years supplier relationships in R&D related activities have moved from an arm's length distance towards integration and collaboration (Lakemond et al., 2006). This transition has been reinforced by the need to stay competitive in an ever changing globalized market. However, both advantages with increased supplier involvement; reduced development time and costs, and improved product quality (Eisenhardt and Tabrizi, 1995), and disadvantages such as loss of proprietary knowledge, reduced control over the development process, and the cost of managing the process (Bruce et al., 1995) have been reported. Therefore, suppliers should not be integrated in the process of product development just for

the sake of it, instead there has to be a justified reasons that the gains of integration outweighs its costs.

In the automotive industry suppliers are often involved both in manufacturing and in R&D and can account for up to 70% of the manufacturing costs and 50% of the engineering costs in some automotive companies (Clark and Fujimoto, 1991). To effectively handle a more partnership-like relationship with suppliers, effective integration is needed (West and Bogers, 2013). However, there is no unanimous best-practice on how this integration should take place. Some research advocates that early and extensive supplier integration results in a more efficient new product development process (Clark and Fujimoto, 1991; Eisenhardt and Tabrizi, 1995), while others argue that the there might be mitigating factors that hinder early supplier integration from being effective (Petersen et al., 2003). For example, detailed assessment of a supplier's technical capabilities connected to a decision which is regarded as short-term or non-strategic might not create enough value to make sense from a business perspective. Still prior research in the field of new product development (NPD) show that supplier integration, if performed correctly, still provides advantages connected to better quality, faster product development, smoother product-launches and reduced costs etc. (Ragatz et al., 1997).

Despite reported positive associations between supplier integration and organizational performance (Lambert and Cooper, 2000), the actual implementation still meets some clear challenges (Petersen et al., 2005). For example, engineers interviewed in a study performed by Petersen et al. (2005) expresses discomfort in including external participants on a new product development where sensitive technical information is discussed. West and Bogers (2014) describes the same problem by mentioning "the not invented here" mentality, meaning the reluctance towards ideas or solutions coming from outside of the company. Business managers also express the difficulty in implementing the desired level of supplier integration. Among the issues mentioned are assessing which suppliers to integrate, how to integrate them and how to make sure that the integration is implemented. Moreover, different views of how supplier integration should be implemented have been discussed. In their studies of supplier integration, Petersen et. al (2005) highlights certain variables that should be focused on when performing supplier integration. Here, they also divided supplier involvement in product development into two different approaches: gray-box and black-box. Where in the former, the supplier and the firm works together towards the final product and the supplier provides expertise, ideas and other input but will in most cases not assume the whole responsibility for the parts, let alone modules. The latter, the black-box, approach means that each company would focus on certain tasks and components, with the supplier being trusted to that extent that they develop parts, components and modules as a whole.

One of the factors with the strongest empirical support is the importance of making a careful and complete analysis of potential suppliers before integrating them in the NPD process (Petersen et al., 2005). Suppliers should both be evaluated on their technical capabilities as well as their cultural fit. Moreover, setting the technical metrics and targets together with the supplier has been shown to be a key element in project team effectiveness (Schiele, 2006). Of lesser importance was using input from suppliers on the business goals and objectives for the project. So using the supplier when setting the technical metrics is of great importance but the business goals can be determined by the firm alone. Schiele (2006) also suggest some criteria for evaluating suppliers. The criteria highlighted are focused on evaluating whether or not the firm in question have the potential to be an innovative supplier. The aspects to be taken into consideration are illustrated in Figure 2.4.

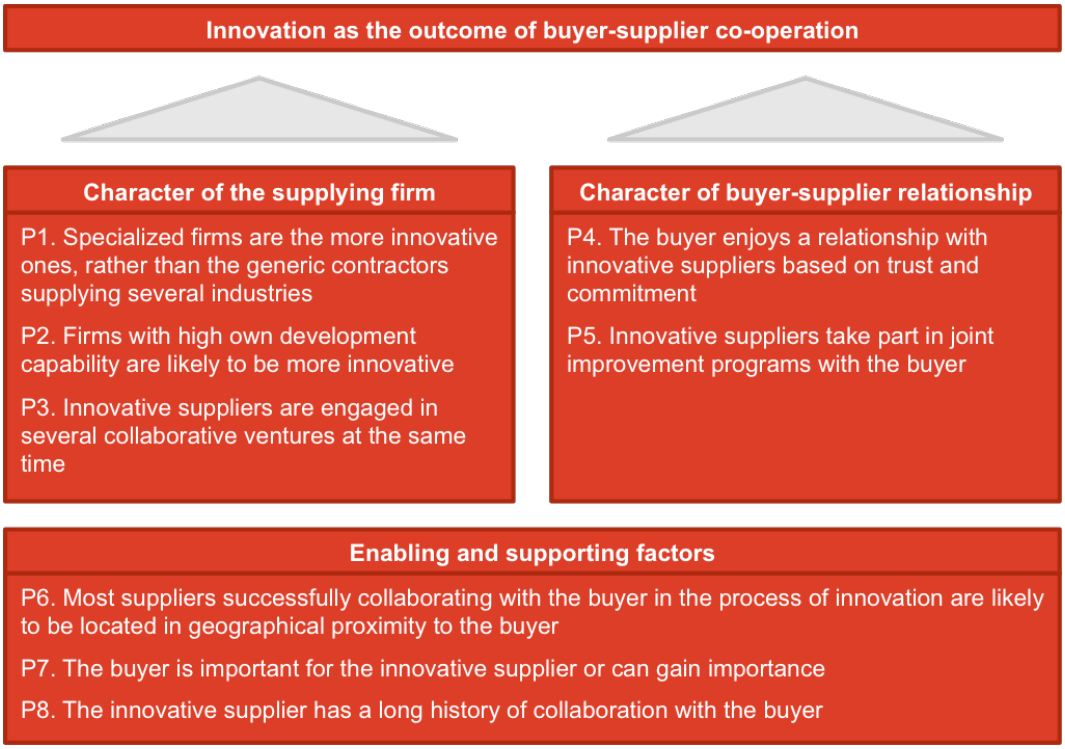

Figure 2.4 Suggested framework for identifying innovative suppliers (Schiele, 2006)

Some researchers have focused on the importance of performing the integration in certain steps to reap the benefits from potential synergies (Das et al., 2006). A difference is made between the internal and the external activities a firm need to perform. Internal activities include the need for purchasing to be involved both in strategy formulation as well as establishing the major goals for manufacturing. The outward focused practices are connected to; collaborative problem solving, development of the partnership structure, thorough communication practices, and supplier development. Amongst other things Das et al. (2006) shows that successful supplier integration must be pursued prior or contemporaneously with the implementation of external practices. In addition, they argue that supplier integration reaches a limit where after that point the usefulness of integration deteriorates. This level would then vary depending on industry field, product life cycle or production strategy etc. As a consequence they suggest that managers try to set a goal for the level of supplier integration in their respective strategic field and build their "ideal" supplier integration model for benchmarking and replication. This would help to visualize both negative and positive deviations and show where adjustments to this "ideal" model is needed.

However, outsourcing product development and innovation to suppliers could lead to required in-house knowledge becomes stepwisely eroded (Brusoni, 2001). Previous research have highlighted that in order to gain understanding of the architectural knowledge, the knowledge about how different components are integrated, one must also have a high level of component-specific knowledge (Henderson and Clark, 1990). Other research have stressed the fact that learning by doing is crucial for this component level understanding which in turn promotes that some component development should be kept at the firm (Zirpoli and Becker, 2011). By outsourcing component design, manufacturing firms might create a situation where they do not have enough knowledge themselves to perform successful integration of the parts. Also, innovation is often coupled with a deep understanding of the product and thus requires

not only an overall knowledge about the system but also component-specific knowledge. Thus, what this suggests is that key component technologies such as components which a) have a direct effect on the performance and b) present a high degree of interdependence with important technologies contributing to the overall performance, should be developed in-house and that engineers at the firm must have the required capabilities to do so. The balance of internal vs. external sources is hard to predetermine, but as Rothaermel and Alexandre (2009) concluded in a study of 141 U.S. manufacturing firms, the optimal financial performance is generated from a mix of 61% external and 39% internal sourcing for innovation.

2.3.1 Managing the costs of integration by effective coordination

In order to reap the benefits of said integration, appropriate coordination have been suggested as a key success factor (Lakemond et al., 2006). By studying the product development process at Tetra Pack they saw three different coordination types which they named: project integration coordination, direct ad hoc coordination, and disconnected sub-project coordination. Project integration coordination means that the supplier becomes an integral part of the product development project and the coordination builds on frequent and in depth interactions. Direct ad hoc coordination is the opposite of project integration coordination. Here, the contact between supplier and buyer company takes place on a more incidental basis. Lastly the disconnected sub-project coordination refers to a situation where the supplier is assigned with a product development task and almost entirely carries it out without interference from the buyer company.

Moreover, suppliers are often shared between several firms meaning that the competitiveness of a company will depend to a great extent on how effectively it manages the supplier relationships (Takeishi, 2001). In order to create this competitive advantage Takeishi (2001) highlights the importance of coordinating activities both externally with the supplier but also internally within the organization. By studying Japanese automobile manufacturers and their suppliers Takeishi (2001) concluded that outsourcing of activities does not work effectively unless there has been extensive internal effort.

The level of motivation of the supplier also affects the resulting component design (Takeishi, 2001). It has also been shown that motivation in itself is an important predictor of the innovativeness of the solution (Andrews and Smith, 1996). Therefore, suppliers must be willing to spend a lot of time and effort on the problem defined by the firm (Takeshi, 2001). The more dependent the supplier is on the company for sales the more motivated they tend to be. However, in line with Zirpoli and Becker (2011) and Rothaermel and Alexandre (2009) regarding the balance between internal and external sources, Takeshi (2001) underlines that relying solely on suppliers for product development is not the solution. The firm must also improve its own capabilities to effectively manage these relationships. What this means in practice is that firms must develop mechanisms for securing the right level of knowledge on all levels. Finally, according to Takeshi (2001) there is no such thing as effective external coordination of product development without effective internal coordination.

2.4 Using supplier innovation as a source for competitive advantage

Prior research have tried to quantify the benefits procured from value creation from external sources of innovation by using standard metrics for NPD such as performance (Lau et al, 2010), rate of new product release (Boudreau, 2010), revenue growth (Chesbrough and Crowther, 2006) and the level of technology patents (Rothaermel and Alexandre, 2009). While much research show that external sources of innovation indeed results in additional

value for the firm, if this value comes from the innovation in itself or is a result from the metrics used to measure it is still debated (West and Bogers, 2014).

Another aspect of the commercialization value of innovations is whether or not the idea from the supplier becomes unique and differentiating for the firm (West and Bogers, 2014). If the supplier has other customers then they might potentially get access to the same innovation which in turn lessens the potential competitive advantage for the firm. Therefore firms using external sources of innovation have to focus on getting the sole commercial claim to those ideas. This can either be done through patents and licenses, through sourcing on an exclusive basis (Chesbrough and Crowther, 2006), sourcing to commodity input (West and Gallagher, 2006) or acquiring the supplier (Christensen et al., 2005).

In order to commercialize on obtained and integrated ideas they must also have a tight connection to the company's business model (Pisano, 2015). There is no number-one-formula of innovation that works for each company therefore imitating someone else's system is not the answer to the problem, even though a lot can be learned from looking at the examples of other cases. Moreover Pisano (2015) argues that the priorities and objectives for different departments often conflict which hampers effective commercialization of the innovation despite a good business model fit. Different perspectives are important to create innovation for aligning different sets of knowledge and create something entirely new (Sethi et al., 2001). However, if these perspectives are not integrated and aligned following a coherent innovation strategy specifically tailored for the firm in question then the power of diversity could even become self-defeating due to deadlock and diverging paths (Pisano, 2015). The innovation strategy should thus both fit the company's business model and be communicated and accepted by all different departments.

2.5 Explanatory synthesis of the chosen literature

The literature included in Chapter 2 was chosen so it would fit the four-phase model by West and Bogers (2014) and correspond to the overall theme of the thesis; supplier innovation. Crowdsourcing and the methods of crowdsourcing were given additional room because of the novelty and complex nature of the concept, in comparison to the use of suppliers. Moreover, (2) collaborative communities and (3) complementors were left out because they were not considered relevant methods for Company X. Collaborative communities were considered a too complex task to handle to be relevant for the purpose and complementors does not apply since Company X's products don't, and are very unlikely to ever do, act as a platform where complementors can add their own functionality. The intended weight of suppliers as a source of external innovation is instead reflected in the parts about integration and commercialization. Theory on supplier relationship was added due its relevance when encouraging suppliers to engage in the closer relationship that joint or outsourced development activities require.

3 Methodology

In this chapter both the research design and the chosen methods will be presented. In the first subchapter the research design and method will be described. The following section describes how data was collected and analyzed. Lastly quality rigor and validity of the paper will be discussed.

3.1 Research design and method

To be able to answer the research questions proposed, and form a suitable recommendation for how supplier innovation could be leveraged, we decided to study the case of Company X in depth. In order to provide convincing recommendations we focused on finding a general approach on how to best structure case study research. This included having a theoretically based method for forming and conducting semi-structured interviews as well as using the systematic approaches, as described by Gioia et al. (2013) to analyze the data.

Case study research has in recent years increased in popularity (Yin, 2013). A case study seemed suitable since it does not require the researcher to be a part of the investigates subject, but still enables the researchers to study it and draw relevant conclusions from the collected data (Wallén, 1996). Moreover, case studies have been proven a useful tool in the early critical phases of new management theory (Yin, 2013), which goes well with the novel subject of supplier innovation. Case study research is mostly based on interviews (Yin, 2013), which will also be the basis of this paper. Yin (2013) further argues that interviews are a good way to understand more about the subject in question provided that interviews are conducted without leading the interviewee in any particular direction.

However, case studies have received criticism for lacking validity and reliability (Yin, 1981). Quantitative studies can more easily make statements to prove their significance using statistical facts and other concrete models, something that case research with its more qualitative nature, usually cannot (Siggelkow, 2007). In addition, sample sizes in case study research are usually limited, which could make it hard to draw general conclusions.

Based on the problems mentioned above we decided to spend a lot of time reading up on how to perform semi-structured interviews, more on how this was done will be described in the subchapter; Data procurement. Moreover, since this case study was completely qualitative we decided to apply the systematic approach developed by Gioia et al (2013) when analyzing the data. They propose a two step model where data is initially analyzed by using the exact terms and codes as stated by the interviewee (1st-order analysis), proceeded by 2nd-order analysis where field specific language, concepts themes and dimensions are used. By using this systematic approach the conclusions drawn can be clearly demonstrated and linked to the data collected. As Gioia et al. (2013) describe it, the method also allows for the types of insights that are a hallmark of high quality research. A more detailed description on how this was done will be presented in the subchapter; Data Analysis.

Another problem with case studies is that researchers might be too detached to the studies' subjects, not being able to gain enough trust or speak the same language as the interviewees (Easterby-Smith et al., 2015). For this paper we had a mixed connection to the studied firm. One of the researchers has been part-time employed at the company for almost three years, which made it possible to get hold of influential individuals and gain their trust. The other person did not have any prior relationship at all with the company and that person instead took the role of the outsider. Combining insider and outsider perspective is usually recommended (Easterby-Smith et al., 2015) and also proved to be very useful.

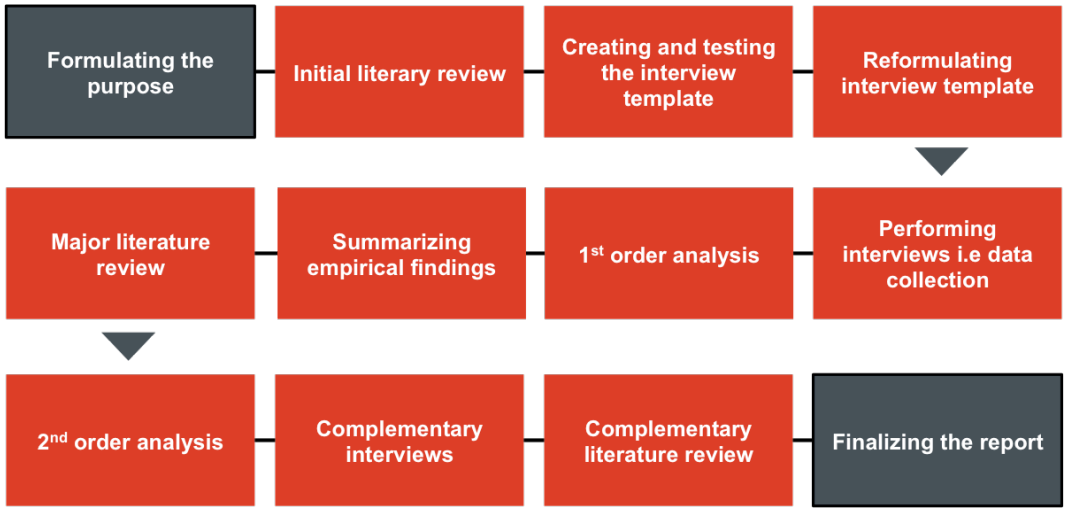

Figure 3.1 Research design

Figure 3.1 illustrates the process flow by which the thesis was conducted and the research questions were answered. Meetings with the supervisor was held when enough new material had been collected or analyzed to ensure that the work performed was efficient, satisfactory and held the sought after level of quality. Using the systematic approach made the overall process more efficient since we waited with the literature review until we knew what literature that was needed. Especially since the interview questions were open-ended and sometimes yielded some unexpected but interesting answers.

3.2 Data Collection

The data collection process will differ depending on the subject under investigation as well as the chosen research approach (Wallén, 1996). In this case, the systematic inductive qualitative case study approach has guided the process of data collection.

Data can be divided into two different categories: primary and secondary data (Eriksson et al., 2008). Primary data means securing information directly from the source such as interviews and observations. Secondary data is defined as compiled information that does not come directly from the source; this could be literature about the subject in question, media coverage or other related documents. The key elements emanating from the approach chosen in this research paper are that the data has been collected from semi-structured interviews complemented by our attendance on an innovation workshop. Thus the data has primarily been collected using primary sources of information. This data has then been compiled in accordance with the 1-st order model. When progressing to the 2nd-order analysis the primary data was complemented by information from relevant literature as well as internal company documents. Thus, both primary and secondary data have been used to answer the first two research questions, with an emphasis on primary data. As for the third research question, mostly literature and implications from interviews and company documents were used, i.e. literature was the main source of information. One possible improvement for this thesis would have been to complement this suggestions for methods by interviewing relevant actors. However since time and resources were scarce we focused on collecting primary data for the two first research questions.

3.2.1. Interviews

Since semi-structured interviews has been the primary source of information for this master thesis there has been great emphasis on creating a high quality interview process. First we read up on relevant literature on how to conduct a semi-structured interview in the best possible way. Prior researchers propose mostly similar ways of conducting interviews which we have summarized to the following guidelines: 1) Identify the prerequisites for using semi-structured interviews 2) Retrieving and using previous knowledge 3) Formulating the preliminary interview template 3) Pilot testing 4) Presenting the interview template 4) Perform the interviews in a state-of-the-arts manner (Kallio et al., 2016; Rabionet, 201; Turner, 2010)

In addition, the interview template was constructed by using suggestions made by Rabionet (2011) as well as comparing with interview templates made by people more skilled in the art (e.g. Elerud-Tryde, 2016). What Rabionet emphasized was that introducing the questions in the right way may be more important than the actual questions in themselves. Therefore we put a lot of effort in trying to make the interviewee relaxed and feel trust towards us as interviewers. This included thoroughly explaining the purpose of the interview as well as stating that we were aiming to help them become better rather than finding things to criticize. Moreover, having one of us being a part-time employee since three years back and having worked with many of the interviewees helped significantly with creating the right interview setting. Before starting to use the interview template we did a pilot test, asking first each other and then other master thesis students. Lastly our supervisor Sara Fallahi did some final remarks, which resulted in the first final interview draft. However the interview template worked as a guide rather than a protocol and in accordance with the model presented by Gioia et al. (2013) the template was reformulated during the interviews in order to understand the dynamic process that the researchers tried to depict. Alternations was made during the process, all different versions can be seen in Appendix 10.1.

As for choosing people to interview, we wanted to cover all different areas of the business but also complement with different views within the business line. Since the subject covered supplier innovation we also wanted to interview some of the suppliers used by the company. When contacting the people at the company we primarily used suggestions from our company supervisor and his manager. We also asked at the end of each interview if they had any suggestions for us with whom we should talk to and that also gave us some important names. The length of the interviews was about 1 hour each. We had not decided a set number of people to interview at the beginning but we did have some key actors that we knew that we had to talk to. After conducting a total of 14 interviews, where 12 was with company representatives and 2 with supplier representatives (see Table 3.1 for complete list of interviews), we felt that we had enough information to start analyzing the gathered data. However during the analysis we also asked some clarifying questions to some of the interviewees or revisited the recordings to make sure that we had got all the facts straight.

One of the limitations for this part of the data collection was that we had much easier access to interviewing personnel in-house than the suppliers. This is reflected in the ratio between internal vs. external interviewees. The interviews with the supplier had to be initiated by Company X and therefore the researchers did not have as much control as with the interviews held in-house. We cannot be sure whether or not more interviews with suppliers would have changed the outcome of the thesis but had we had more time, additional supplier interviews would probably have been the next step.

Company interviews	Date
Sourcing Manager FLT	1 February 2017
VP R&D Mobile equipment	13 February 2017
Head of R&D FLT	17 February 2017
Project Manager Coming Generation / Head of R&D CCH	22 February 2017
Sourcing Manager MAU	22 February 2017
Global Head of Sourcing TT	1 March 2017
Category Manager	1 March 2017
Head of FLT	7 March 2017
Sourcing Manager MAU	14 March 2017
Category Manager	16 March 2017
Head of R&D TT	21 March 2017
Head of Sales CCH	22 March 2017
Supplier interviews	
Role Supplier 1: Key Account Manager for Company X	27 March 2017
Role Supplier 2: Key Account Manager for Company X	2 May 2017
Observation	
Workshop coming generation project	9 February 2017

Table 3.1 List of interviewees

3.2.2 Observations

In addition to interviews, observations can be used as a source of primary data. Moreover, the gathering of information through observation can be time consuming and challenging (Chung, 2003) but the strengths of seeing the actual setting for yourself might also give the clarification needed to thoroughly understand the system (Spradley, 2016). For this paper we attended a workshop, as pure observers, held at Company X. This was done both in order to understand the current processes by which the firm stimulates and captures innovation but also to get a feeling for the culture of the company and how people interact between different departments. Notes were taken during the observations. The notes were then later used both as a comparison to the previously collected information but also to make sure that the initial thoughts were captured at the precise moment they occurred, and thus not subject to being incorrectly remembered.

3.2.3 Literature collection

Regarding the literature collection made for suggesting methods that Company X could work with when going beyond suppliers as a source of innovation the main focus was to find articles written by influential people, based on number of citations, within the field. In much the same way as the literature search for the theoretical framework we focused on asking knowledgeable people in the field as well as searching on Google Scholar to look for citations. By doing so we could create the foundations for the recommendations to Company X.

3.3 Data Analysis

Like for all research work the qualitative analysis are supported by documents, observations, and archives but the heart of the research is the semi-structured interview (Gioia et al., 2013). In order for the data from these interviews to be compiled and linked correctly they we first compiled them in the 1-st order manner (see Appendix 10.3.1). Instead of categorizing or making connections to literature we merely compiled the statements. Later on, as we started with our analysis, the search for similarities among the statements began. According to theory, you can either bundle by deciding on specific keywords from the beginning or go through the data and aggregate where patterns emerge (Easterby-Smith et.al, 2012). We decided to code by aggregating patterns where we saw them to make sure that we did not miss anything that could significantly contribute to our work. In accordance with the work made by Gioia et al (2013) we now had to think on multiple levels at the same time and work as knowledge agents, meaning that we had to know what we were going to do and could explain our thoughts, intentions and actions. As the work progressed even more links between the categories could be made, and thus reducing the number of categories even further which eventually lead to the creation of the 2st-order analysis level (see Appendix 10.3.2).

Some initial literature studies were done to capture basic knowledge in the subject. However, as recommended in the systematic approach, the literature review was mostly done after the primary data collection. This semi-ignorance to the literature at hand was done trying to avoid the confirmation bias, i.e. tendency to confirm our own, already existing, beliefs. However, as the work progressed, literature was used more extensively in order to conduct the analysis and create the final recommendation. When conducting the literature study we experienced a fine line between being knowledgeable enough to ask the right questions whilst still avoiding using a more academic language.

When choosing which articles to use for the literature review and subsequent analysis we decided firstly to ask more knowledgeable people within the field such as other professors, PhD students, our supervisor etc. We did that because we wanted to be sure that the references used were firmly established to current academic standards. After we had found some interesting articles we decided to extend our literature search by using the referencing articles in those papers. Although this procedure took a bit longer time than just searching for articles on different search engines such as the library catalogue or Google scholar, we found it much more rewarding in terms of quality. If we still could not find relevant articles we used Chalmers library catalogue together with Google Scholar. Google Scholar was used to find the articles and check that the numbers of citations reached a predefined standard that we had agreed upon with our supervisor, no less than 100 citations, and then the Chalmers library catalogue was used to retrieve the chosen articles.

3.4 Quality Rigor

In order to gain the benefits of using case study research i.e. studying phenomenon in their actual setting as opposed to interdependent of context one must make sure that certain criteria are fulfilled (Gibbert et al., 2005). There is a plethora of different criteria to assess the rigor of the research quality. For this thesis we chose to base the criteria on what is called the positivist tradition (Behling, 1980). Although small sample case research follows a more constructionist view, we were more experienced with this way of determining quality rigor, based on previous studies e.g. when writing our bachelor thesis, which is why we chose this approach. Within this tradition there are four criteria how to assess the research quality: internal validity, construct validity, external validity and reliability.

Regarding the internal validity the researchers should commence by stating explicit research questions (Gibbert et al., 2005). Moreover it is important to match the patterns of those observed by other authors and use theory triangulation, confirming through several sources, to confirm findings. By talking to different people from different departments and/or different hierarchical levels we could confirm our findings. In addition, the discussions with our supervisor Sara Fallahi as well as comparisons with prior research enabled us to assess the validity of the collected data. Lastly, the views of the suppliers and the views of in-house personnel were compared to make sure that those views were aligned. Since one of the authors had gained trust internally by being employed at the company we were also able to get a fuller picture with more detailed information. To summarize; with case study research one cannot be entirely sure about the internal validity but in this case the combining and comparing different perspectives arguably helped to strengthen the quality of the study.

Construct validity means that the researcher should establish a clear chain of evidence to allow the reader to understand how the researcher conducted the process and came up with the concluding findings (Gibbert et al., 2005). To ensure that the validity of statements from company representatives we compared them with our observation of an actual activity as well as with other interviews, and made sure that their answers matched. Moreover we compiled the data using a 1-st order and 2-nd order framework. Both of these steps are attached in Appendix 10.3 for the reader to be able to follow our line of thought.

As for external validity, it is suggested that you either make several case studies of different organizations or have a nested approach, meaning that you perform different case studies within one single organization (Gibbert et al., 2005). Neither of these approaches was possible for this paper. To ensure external validity we tried to make sure to guide the reader as to why this research could be interesting from a more general perspective and by motivating why the case study approach is valid to reach such conclusions.

Lastly, with reliability comes the task of presenting what you have done in such a way so it is possible for other people to reach the same conclusions as you have (Gibbert et al., 2005). The systematic approach used was an integral part of the process in trying to secure the readers trust and ensure reliability. From the 1-st order statements to the 2-nd order aggregation it should be easy to follow how we came up with the final analysis and subsequent recommendation. Statements from all the interviews can be found in Appendix 10.2; these statements have been presented as true to the original as possible in order for us as well as others to revert to the original source.

4 Empirical findings

This chapter will present a more thorough description of how Company X is organized and structured as well as the findings from the interviews held. Section 4.1 contains an overview how the company is organized and how the different departments of interest is governed. In section 4.2 the main findings of interviews with Company X employees will be presented and in section 4.3 the main findings from interviews with suppliers are recounted.

4.1 Company X's organization and governance

The MEQ division is divided into three separate business lines (BLs): Forklift (FLT), Terminal Tractors (TT) and Counterbalanced Container Handlers (CCH). Each business line (BL) is run by a vice president, reporting to the MEQ VP, and operates, in many aspects, like an own company within Company X. That is, while some activities goes across BLs each BL has their own R&D, sourcing, sales etc., functions, management team and performance objectives. See Figure 4.1 for organizational chart with selected functions.

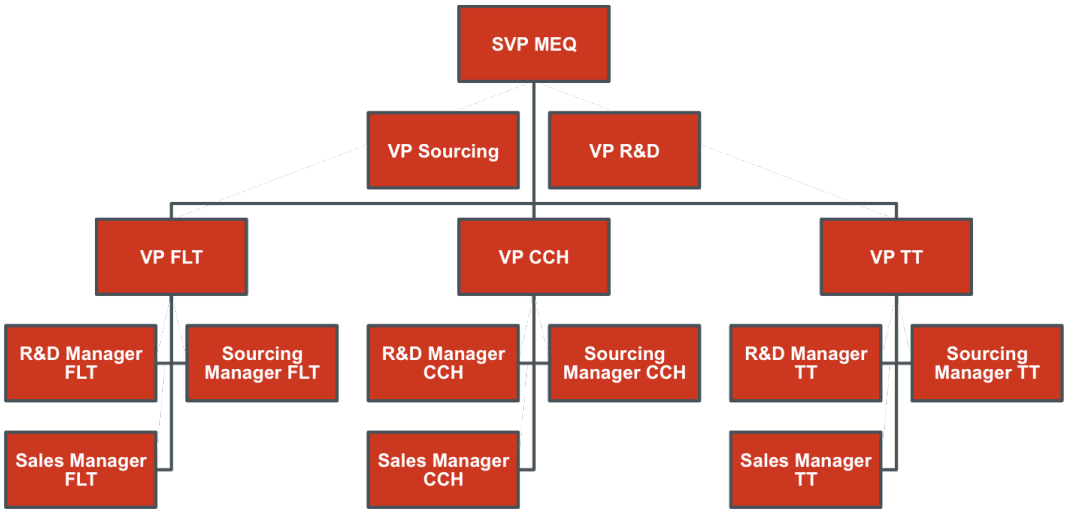

Figure 4.1 Organization chart Company X

The production is executed at manufacturing assembly units (MAUs) located around the world. These MAUs are not necessarily tied to the manufacturing for specific business line and some MAUs are producing products for several business lines. Apart from the employees tied to a specific BL, each MAU has personnel tied to a certain operational function such as sourcing or human resources for that specific MAU. The strategic BL governance is however centralized to Sweden for FLT and CCH, and USA for the TT BL. More thorough description of how this is organized can be seen in fig 4.2 and in the paragraphs below.

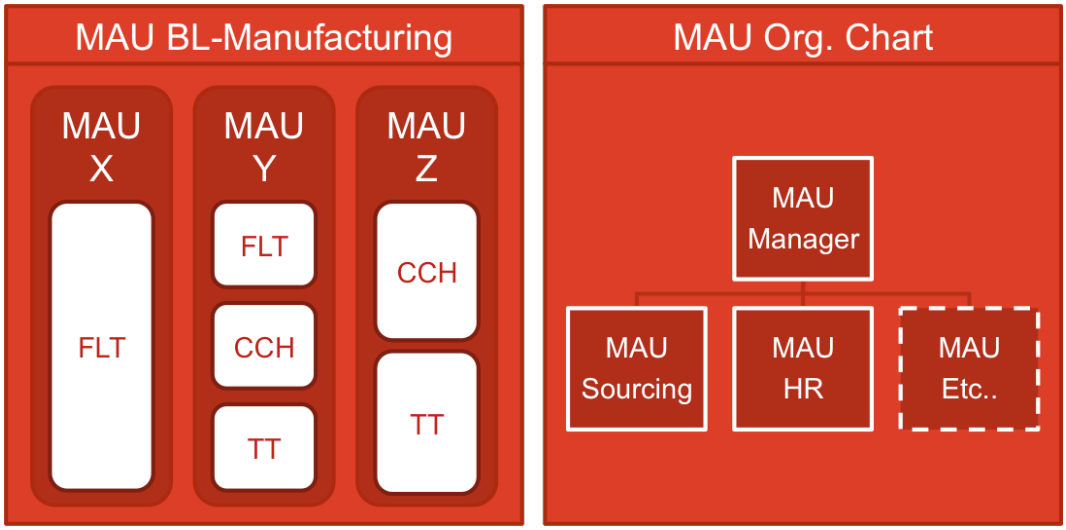

Figure 4.2 Explanation of MAU and BL relationship

4.1.1 R&D

MEQ's R&D department is run by the VP of R&D, reporting directly to the VP of MEQ and a member of the management board of MEQ. The VP role is relatively new and was introduced in 2015 as a response to a growing concern from management regarding how well equipped Company X really was to handle future market demand. The VP is not personally involved in any operational development activities but is rather responsible for the long-term strategy and process efficiency of the R&D department.

Each BL's operational R&D activities are led by a R&D manager, who in turn is responsible for coordinating the work of his or her BL's development team. The department could be said to have four areas of responsibility: (1) product care; (2) customer customizations; (3) NPD; (4) advanced engineering (pure innovation efforts). The development teams of the FLT and CCH BLs are based outside Sweden and the TT BL has their development team in USA. Some MAU's have their own small R&D team handling adjustments because of local market needs and where the change is deemed not to require much involvement from the central BL team. Teams like this are, for example, located at the MAU in China. Moreover, within each BL team responsibilities are allocated according to the different component categories where one or more individuals are responsible for a certain category.

4.1.2 Sourcing

The VP of sourcing is the top manager of the sourcing department and the responsibilities are much like those of the VP of R&D. Again, the VP is not responsible for the operational day-to-day business of the department but is rather the source behind the strategic direction of all sourcing activities. The sourcing department is structured differently from R&D and follows a rather complex hierarchy with different subgroups that have different responsibilities. Basically, the sourcing department consists of four different sections: (1) BL Sourcing; (2) MAU Sourcing; (3) Category management; (4) Supplier Development Management.

Each BL has their own sourcing manager who is globally responsible for the sourcing activities for that BL and together with a group of subordinates constitutes the BL sourcing team. The BL sourcing team sets the strategic direction of the BLs sourcing efforts and is responsible for all sourcing activities related to their BL. However, since the MAUs are spread across the world, it does not always make sense for all MAUs to use the same suppliers for all components, in fact most MAUs have a totally different set of suppliers. To

handle these local variations and free up time for the BL sourcing team to work on more strategic questions each MAU has their own sourcing personnel that is not tied to a specific BL but rather handles the day-to-day business for their MAU. More concretely, the BL sourcing personnel, together with the category managers, are responsible for and sets the tone for the strategic decisions and choice of suppliers for the more critical components while the MAU based sourcing personnel handles the everyday operational activities as well as local sourcing for less critical components. What should be noted though is that for some production locations, such as one of the MAUs in USA, the MAU sourcing personnel also constitutes the BL sourcing team.

Next there is the category management section, a sort of cross functional leg of the sourcing department with the purpose of aligning the different BL's sourcing activities. Each component that is purchased and used is categorized into a certain category, be it electrics or hydraulics. Each MAUs sourcing personnel have a category that they are responsible for, their MAU. On top of that are the global category managers that are responsible for a certain category across all of Company X. The top level category managers are, however, seldom involved in any decisions regarding simple components that are purchased by the MAU locally, but rather the strategic direction of the category or decisions regarding more complex and critical components. The global category managers have also been appointed to handle the newest innovation initiative, supplier technology days, where suppliers from a certain category are invited to present their latest technologies.

Finally, the supplier development section, or SD, is a support function for internal stakeholders aligned with the ordinary sourcing teams. The SD section has a strategic focus on driving quality and delivery performance, continuous process improvements, and lowering total cost for the company, as well as the suppliers, and end customers. Much of the SD section's work consist of monitoring and following up on suppliers KPI's to ensure that all suppliers are meeting the requirements set up by Company X. The SD section is also responsible for a new initiative called enhanced supplier relationships, or enhanced SRM, with emphasis on strengthening relationships with key suppliers.

4.1.3 Sales

Each BL also have their own sales and marketing organization with a network of both wholly owned dealerships and partnerships with third-party resellers. The sales organization is described as the link between the customers and the internal functions, much like sourcing is for suppliers, and has an important responsibility in scanning for and determining current and future market demand.

4.2 Main findings from interviews with Company X employees

The main findings put forward in this section are findings that were considered to align well with the purpose of this thesis. The findings have been further categorized into four areas which treat different aspects of the current situation at Company X: Emphasis on extended relationship building, leveraging suppliers in the development process, managing the need for innovation and, sources of idea and idea evaluation.

4.2.1 Emphasis on extended supplier relationship building

From the interviews it is apparent that well managed and fruitful relationships with suppliers are considered to be of great importance for Company X. This is true whether employees from R&D, sourcing, sales or BL VPs were interviewed. Several of the interviewees specifically stressed the importance of having an open, mutual beneficial, trust-based, win-

win, long-term relationship with suppliers rather than focusing only on keeping procurement costs as low as possible. To achieve this, fostering existing relationships as well as attracting the pioneering suppliers, Company X has put in place a strategic initiative to be the "customer of choice". This initiative aims to communicate the benefits of working with Company X and showing that they are a company to partner with for the future. Employees describe this as fundamental for a successful outcome. This emphasis is particularly evident in the enhanced supplier relationship strategy that Company X has recently launched for a small number of their most important suppliers. Worth noting here is that this supplier strategy has received attention from Harvard Business Review.

"A customer-supplier relationship should not be focused around squeezing each other's margins, but rather on openness and win-win mindset" - VP Business Line

There are several different qualities that are sought when it comes to choosing which supplier to work with. The basic requirements, mentioned in a majority of the interviews, are financial stability, quality in products, as well as in delivery, and enough production capability to meet the required volumes. In addition to the basic requirements many other aspects are brought up. The supplier's flexibility in terms of meeting changed demand, new specifications, and swift correction of faulty components are highly valued and is perceived as the supplier's willingness to prioritize Company X over other customers, something that is naturally desired. Moreover, the supplier's capabilities and willingness to invest in R&D, their ambition to be the market leader in their industry, as well as their eagerness to learn of Company X and its customers are perceived as something particularly important for suppliers that Company X looks to engage in closer relationships with. It is however stressed that suppliers do not necessarily have to be big and well established, but could as well be a newcomer with great potential. In contrast, one aspect surfaced that is not as obvious as many of the others; the value of the supplier's own brand. That is, it is much easier to sell the product if it contains an engine from a world-known engine manufacturer rather than an engine from some small unknown manufacturer. Therefore, Company X has to take into account the end customer's perceived value of a certain supplier's brand.

However cost, is and will always be, a determinant when it comes to selecting suppliers. As a consequence, with costs savings being budgeted for and strictly measured, much of the activities performed by the sourcing department have been focused on keeping purchasing costs down. This focus on price is particularly evident in the dual sourcing strategy that Company X employs, which in practice means that every component should have two potential suppliers that can be played out against each other to reduce the cost of procurement. Even though it is used for many components, this strategy has not spread across all components and categories, actually some sourcing personnel don't follow it at all. Cost does, however, also include the cost of potentially switching supplier, which could require investments in new tools and/or IT systems.

"Innovative companies are not always the biggest most known. They could be a market disruptor trying to enter a new revenue stream" - Business Line Sourcing Manager

As with many things, it is evident from the interviews that the strategy of selecting suppliers is subject to deviations due to subjectivity and conflicts of interest. As an example, the R&D department main focus is often to work with a supplier that has the best or most technically advanced product, while the sourcing department could value cost higher than product performance if there's an alternative that is sufficiently good but significantly cheaper. In

addition, convenience in terms of where the supplier is located could weigh in if the decision maker values ease of travelling or prefers talking in their mother tongue. There are however mechanisms in place to prevent such inconsistencies. To avoid suppliers being chosen for the wrong reasons and to ensure that the choice of supplier is reached under consensus all new suppliers have to be accepted by a cross-functional team with representatives from several departments and the concerned category manager.

When asked what makes Company X a company that suppliers would want to work with a majority of the interviewees answer that Company X is the market leader in their industry and that it is the greatest incentive. Others state that Company X has long been perceived as an innovative company, which is why suppliers would be interested in working with them. All of the interviews do however stress that the biggest suppliers, where Company X is just a fraction of the supplier's revenue, probably do not perceive Company X as particularly important in comparison to other customers.

4.2.2 Leveraging suppliers in the development process

There is consensus among the interviewees that leveraging suppliers' innovation capabilities are of great importance for the future of Company X. Company X cannot be the expert in every field of technology and must rely on working with the most innovative and market leading suppliers. Many of the interviewees bring up the automotive industry as a good benchmark for how the customer-supplier relationship could look like and underlines that the automotive industry has historically been years ahead on new technologies as well as on leveraging the suppliers' capabilities.

As of today, there are basically two ways that suppliers are involved in Company X's development processes. One being when Company X has a problem or a need that they have to solve and thus look for a supplier that can solve that problem or meet that need. The other one being when a supplier approaches Company X with a new idea on how a product can be improved or developed differently. The former one is most common in NPD projects, where suppliers are almost always involved in some way and often in the very beginning of the project. In such cases, where Company X has a specific problem they want to solve, Company X turn to their existing suppliers within that particular technological field and ask them how they would go about solving the problem. The suppliers that are interested and have the capabilities to solve the problem will then present their solution for Company X to evaluate and possibly proceed either through co-development or full outsourcing. However, a concern highlighted in the interviews was that of integrating designs from suppliers into Company X's system, much because they were simply designed in a software different from that of Company X's. Therefore a translation software was requested from the R&D department but was denied by the management in the end, due to high costs.

In the interviews an interesting benefit, that Company X gets from this procedure of letting suppliers present their solutions to a specific problem or requirement, was brought up. In the process of evaluating different suppliers' offerings Company X themselves learn a lot about what technologies there are and how competing solutions function. As such, Company X gets to know even more than the suppliers themselves, since they are not communicating with each other, and Company X is the focal point of the relationship. For example the transmission category at Company X gets insight knowledge about how two suppliers think about a certain type of component and they can use this knowledge to either develop something on their own, or influence the suppliers they eventually choose to make adjustments, in the end capturing

the best of all available technologies. In addition to the immediate benefits of a better component, Company X's employees educate themselves for coming industry trends.

"Meeting and learning of several different suppliers and hearing of their solutions educates us a lot about what technologies are out there, which we ourselves can leverage" - Head of Business Line R&D

The other way that suppliers are involved in Company X's innovation process, the one where suppliers bring their ideas to the table regardless of whether or not Company X has presented a specific problem they want to have solved, is less structured and standardized. From the interviews it is evident that the employees at Company X recognize the need not only to ask suppliers to solve specific problems or meet certain needs but also to simply ask the suppliers *what* they are capable of doing and what new technologies they have in their pipeline that might be of interest for Company X. To satisfy this matter, Company X either engages in discussions with existing suppliers or looks beyond their current supplier base for new interesting suppliers to work with. This citation captures the matter well:

"We can't passively wait for suppliers to bring ideas to us, we must actively go out and scan the market for current or emerging technology leaders" - Business Line Sourcing Manager

Officially, the responsibility of finding new suppliers lies on the category managers' table, but employees from all departments are allowed to, and have historically done so, search for new suppliers that they consider interesting. It is also noted that there are differences between the categories when it comes to how active the category managers are in searching for new potential suppliers. Some category managers are very active and are constantly looking for new suppliers or new technologies while others are satisfied with what they currently have, as long as there are no major problems. This pattern is not entirely caused by pure inactivity from the category managers, but also depends on how complex or technologically advanced components from a certain category are. Some categories contain very complex and technologically advanced components that naturally develop much faster than other less complex components such as bolts, screws and brackets. Moreover, it is emphasized that a suppliers is not necessarily the most innovative or forward striving because they develop the most advanced components. Being innovative when it comes to the process of manufacturing the component could also be of great value for Company X due to potentially lower procurement costs. Thus, specifically from the BL managers' point of view, all categories should emphasis being proactive.

Nevertheless, to meet the need of staying in the forefront of technological advancements, Company X has put in place a couple of activities with the purpose of "drawing out" the latest technologies from the suppliers. First, there are the quarterly meetings arranged between the supplier and a cross-functional team from Company X. In these meeting the suppliers get the chance to present their latest technologies and where they are currently investing resources. These meetings are considered a good tool to both learn of new technologies but also to get a feeling of how innovative and proactive the suppliers are. This could then be used an indication whether the suppliers is a partner to continue working with or not. A more recent initiative on the same theme is "supplier technology days", a week were several suppliers from a specific category are invited to share their latest technological advances as well as learn more of Company X's business and customers. Worth noting regarding the supplier technology days is that during the first one, held in late 2016, no supplier managed to win the "most innovative" supplier award. Why that was so is not completely clear from the

interviews. One interviewee suggest that the suppliers participating in the award process possibly thought of being innovative as being the one offering the lowest cost, rather than the best technological advancements, since that is what Company X historically has valued.

Another activity that has been used by Company X is "walk around workshops". In these workshops, suppliers from different fields are invited to a workshop where they get the chance to walk around Company X's product and come up with suggestions on how certain parts can be improved. Reportedly, this activity lead to 24 components being selected for change of material and 12 selected to be manufactured differently. Whether these changes will actually be implemented remains to be seen since there are proposals to be evaluated and quality to be ensured. This activity is said to be more focused on finding ways to lower the costs of the components down rather than finding the next big game changer. All these activities mentioned are only directed at existing suppliers.

Reaching out to and discovering new suppliers are handled in a different way, and it is clear from the interviews that there are no standardized procedures in place. In the interviews there are mainly three methods employees describe when discovering new suppliers and new technologies: (1) attending industry expos, (2) using corporate group network (3) browsing the internet. At the expos Company X gets the opportunity to see what is new technology-wise and learn of what up and coming suppliers. Through discussions with the corporate group network they could get inside tips on new suppliers that have already been evaluated within the group. The third method, browsing the internet is brought up in almost all interviews as a tool for learning of new suppliers and new technologies, but it ultimately falls to the category manager's willingness to invest time into it.

"I would love to have a better and more structured way to discover new suppliers" - Category Manager

Besides the methods described there are also the case of new suppliers approaching Company X uncompelled. From the interviews it is understood that this is a very common situation, suppliers, old as new, frequently approach Company X with ideas on how to improve existing components or how the Company X's product itself can be radically changed. These "ad hoc" supplier ideas most commonly reach the sourcing department first because naturally are the link between the company and its suppliers, but can come to other departments as well.

4.2.3 Managing the need for innovation

Company X wants to be perceived as the market leader in advanced technology and there's consensus among the interviewees that Company X has historically been pioneers in the industry. In contrast, a majority of the interviewees were concerned about how much innovation activity Company X actually has. Basically all of the interviewees stated that there is far too little focus on innovation in the company and one of the R&D managers stated that there are no systematic innovation efforts at all at his department. The VP of R&D goes even further and describes a company that more or less entirely lacks a structure for managing innovations. This is explained as a consequence of too much focus on short-term profit and heavy BL focus that Company X has had over the last decade leading to less focus on R&D investments.

"We must become more long-term thinking and structured in our innovation efforts or face the inevitable fate of being outcompeted" - VP R&D

To try and structure the innovation process and enhance the synergetic effects between the different BLs Company X, initiated by the VP of R&D, has recently started a project called "coming generation" with focus on what the next generation of products will be and how to get there. The project is based on a number of workshops where cross-functional teams from all BLs meet and discuss what technologies to have in the products and how the different BLs can work together to ensure cohesion with the products.

In these workshops, and from the interviews a lot of problems surfaced that can help explain why there is a lack of innovation efforts at Company X. The heavy BL focus impairing the synergies the BLs' R&D departments' experiences from working closer together. In this area, the sourcing department is described as much better at collaborating between BLs than the R&D department and it is concluded that the R&D department could benefit from applying the same communication structure. In addition, each of the BL R&D managers interviewed were instead concerned over not having enough resources to manage all their tasks, and specifically not having time to focus on innovation. This becomes more evident when looking at what the R&D department is actually spending their time doing. From 2016's resource allocation data it is revealed that only 5% of the resources, measured in time spent, are spent on pure innovation efforts for the FLT BL, even though 15% is budgeted for. Even though numbers differ slightly between different BLs, all R&D managers that were interviewed stated that they have never been close to reach the budgeted 15%.

"The 15% budgeted spend has never been met, we simply do not have enough time to put on advanced engineering" - Head of Business Line R&D

One cause of this is explained as a lack of time due to other areas of responsibility taking up too much room and thus blocking resources from being freed up to work on innovation efforts. Some tasks are described as trivial and repetitive but yet time consuming and therefore cause frustration in the R&D department. Another cause is described as the way the R&D department is structured, where the same people working with product care, customer customization and NPDs are also the ones that should focus on innovation. The latter situation is however not described as a problem by all of the interviewees. For example one R&D manager endorses the current structure of having the same people working on the day-to-day business as on innovation efforts since it comes with a lot of synergetic benefits. The manager emphasizes the convenience of having the people that knows the products best also performing the innovation activities, since it ensures that the innovation efforts are put on the right things. This view is, as mentioned, not shared among all the other interviewees and some brought up separating the R&D teams into two different groups as something that could come with a lot of benefits. The differences between what people perceive as a problem is, however, not ill-founded since the BLs themselves, as well as the categories, differ in some areas. The FLT BL has the by far the highest level of customer customization, while CCH has the most complex products, and TT is neither particularly complex nor has a lot of customer customization. There's also a huge difference between how complex the different categories are and what being innovative really means.

Another topic that surfaced is what role the internal R&D department should have. Currently, depending on what type of component and what category it belongs to, most of the drawing is made by Company X's R&D department and then sent to a supplier for manufacturing. In some situations the suppliers are involved in the drawing but sometimes they merely manufacture what is specified on the drawing. In this process there's a discrepancy between what different employees describe as best practice. Some interviewees emphasis the need to

go from technical specifications, where the internal R&D department does the design, to a more functional specification where Company X's own personnel creates a list of requirements of what the component should be able to do and then the suppliers themselves do the design. Advocates of this process argue that it would free up a lot of time for the R&D personnel, especially when it comes to spending time drawing less critical components such as brackets and plastic details, to focus on innovation activities instead. Others argue that the internal R&D department should focus on integrating the different components that have been developed by the suppliers and essentially do no drawing on their own. There is, however, a concern from other departments that the R&D thinks they always knows what is best, and is therefore reluctant to outsource too much of the development to suppliers.

"The R&D department has a "we do it best" mindset that makes it hard to move more development to suppliers" - Category Manager

Apart from the challenges that the R&D department faces, other department's role and responsibilities in innovation management was lifted in the workshop as well as in interviews. R&D is naturally the very core of innovation efforts but it is argued that this responsibility should be shared with the other departments as well, and more specifically with the sourcing department. It is the sourcing department that is the connection to the suppliers and it is their responsibility to find suppliers that want to work together on innovation with Company X. To foster the relationship and collaboration between the different departments with regards to innovation Company X is, in addition to the coming generation project, moving their headquarters into a newly built, what they themselves call, innovation centre. In contrast to the current premises, where different departments and BLs are located separately, the innovation centre will house all departments of Company X and be constructed in with an open landscape office environment to facilitate exchange between different departments. The goal of the innovation centre is to create a natural atmosphere for employees to be able to focus more on innovation and collaboration. In the centre, all departments will sit in the same building with easy access to each other and in connection to the centre will be an engineering prototype workshop in which new concepts can be tested. Moreover, linked to the relocation to the innovation centre a new sourcing team will be formed, composed of personnel from the current BL sourcing team, with a strategic focus on supplier innovation. The team members will still keep most of their previous responsibilities but much of the day-to-day tasks will be handled by other sourcing personnel. Management hopes that this initiative will encourage employees to think more and talk more about innovation on an everyday basis.

4.2.4 Sources of ideas and idea evaluation

There are many different sources that drive innovation and development at Company X. First, there's the internal ideation where employees at Company X, naturally mainly the R&D department but also other personnel, come up with new ideas on how a product can be changed for the better. Then there are the three external sources: (1) customers; (2) suppliers; (3) the environment. There is also the case where ideas are co-developed between a customer or a supplier and Company X. Whether one source is more dominant than another depends much on the characteristics of the component in question, or in a broader sense which category that the component belongs to. In some categories internal sources are dominant whilst other categories display much co-development or solely supplier driven innovation. With the environment, the interviewees refer to changes in legislation, such as emission levels, that can drive innovation or sudden increase or decrease for a certain raw material as well as new technological breakthroughs in a particular field. A rough estimate that was mentioned is that 30% of the ideas come from within Company X and the rest comes from

external sources. What is clear is that Company X does not lack in number of new ideas that they are exposed to, what they do however consider an issue is the quality of the ideas and the way they reach Company X, specifically the "ad-hoc" ideas from suppliers. Moreover, using other sources, such as engineering companies and universities, are highlighted as something that have recently come up on Company X's radar, when considering where ideas could originate from.

However, what is raised as a concern from some of the interviewees is that there is no clear contact point that suppliers can turn to and often ideas are initially presented to the wrong person. What has happened in the past is that the idea is disregarded without proper evaluation or gets lost during transit to the right person.

"Sometimes the buyers take these ideas to R&D. Most times they are turned away due to lack of resources. Eventually when buyers receive this information they stop forwarding it and eventually the suppliers stop bringing it to us" - VP Sourcing MEQ

There's also no real, standardized, tool for how to store and share ideas. One category managers specifically mentioned this as a problem for his category and emphasized the need for a platform where ideas can be stored and shared within the organization. Within his category, they have just started such an initiative but for it to be of any real value other categories in Company X must follow. The same person also described the need for a similar tool but for data over different suppliers' capabilities, such as if they have a certain tool or competence. This idea of a platform where ideas can be stored and shared is mentioned by other interviewees as well as a solution to the somewhat chaotic way that ideas currently are handled.

If an idea makes its way to Company X it is evaluated at different stages. Where and how it is evaluated depends on where it originated and whether it would result in a minor or major change to Company X's products. For minor adjustments coming from customers the idea is forwarded to R&D and if they consider it viable technically they will give a cost proposal of what the new design would cost and then the customer has the option to accept the proposed new design or leave the design as it is. If there's a proposal for a minor adjustment coming from a supplier it is initially evaluated by the sourcing department and then by the person responsible for the category the component in question belongs to. If sourcing finds the idea viable they will forward it to R&D for technical evaluation and determining of what it would cost to develop and manufacture.

"Much of the evaluation of supplier ideas was based on my own experience from working with the sourcing department for a long time" - Former Head of BL Sourcing

For major adjustments, be it coming from suppliers, internally or from customers, the process is a bit different. As in the case of minor adjustments, the idea is initially evaluated at the department that receives the idea, if it is considered worth pursuing it is then forwarded to R&D for evaluation. The product manager, a person responsible for a specific product such as a version of a product in the FLT BL, is involved and a small internal project is started with the purpose of doing an initial evaluation and to gather data for a business case. If the idea survives the first evaluation a business case is created and the idea is presented at a product portfolio meeting, or PPM. PPMs are held once every month and include a cross-functional team with the managers, having authority to make final decisions, of several different departments. This is done to ensure that the idea would be viable from a sourcing perspective:

do we have a supplier that can do this? Is the supplier that brought this idea to us reliable? from a market perspective to ensure that customers will actually be willing to pay for it and from a manufacturing perspective to ensure that the new adjustment won't cause troubles when assembling the product. If the idea survives its first PPM either further evaluation is done at the R&D department through a concept design or an NPD project is started to pursue with the idea. The idea is then brought up on every PPM to inform the rest of the Company what the status is and share and discuss if there are any changes that have to be made to the original design. See Figure 4.4 - 4.7 for the evaluation process.

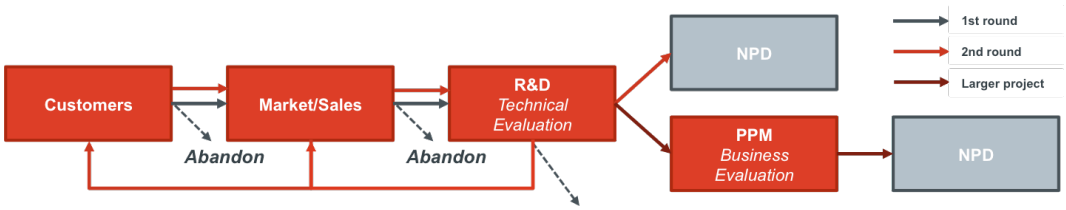

Figure 4.3 Example of the innovation process with the idea coming from customers

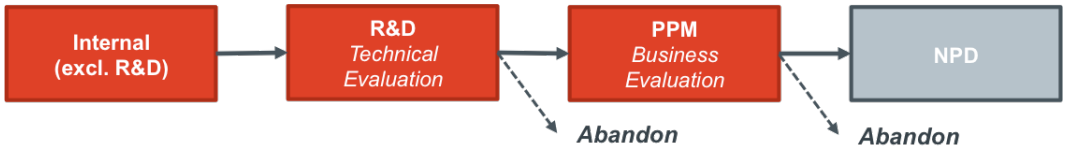

Figure 4.4 Example of the innovation process with the idea coming from internal employees (not R&D)

Figure 4.5 Example of the innovation process with the idea coming from the environment

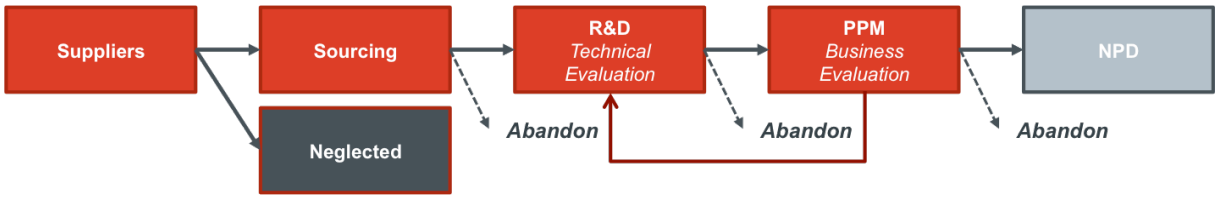

Figure 4.6 Example of the innovation process with the idea coming from the supplier

What is true for all cases though, be them minor or major, is that for an adjustment to be realized it has to be accepted at the PPM, with the consent of the cross-functional team consisting of department managers. The sales and marketing department is described by some interviewees as maybe the most important department when it comes to evaluating a new idea. Even though R&D has cleared the technical evaluation and sourcing has cleared a

potential supplier an idea is worth nothing if there are no customers that are demanding or are willing to pay for it. Further these interviewees suggests that the sales and marketing department therefore must be thorough in their research of whether the idea is commercially viable or not or oven more importantly whether the idea is something that customers are likely to demand in the future.

4.3 Main findings from interviews with suppliers

The main findings from the interviews with suppliers are findings that were considered to help understand how suppliers are currently experiencing working with Company X, and what positive and negative aspects they consider characterizes the relationship. The findings are structured by Supplier 1 and Supplier 2, and include a short description of the suppliers and their business.

Supplier 1

Supplier 1 is one of Company X's largest suppliers from a spend point of view with over 30m EUR in annual sales. Their history with Company X goes back 30 years and they have thus been around during the many changes in Company X. The relationship began when Company X started to outsource more and more of the component manufacturing to third-party manufacturers, and during that time Supplier 1 bought Company X's cabin manufacturing unit. The start of the customer-supplier relationship therefore came very natural and has since expanded into Supplier 1, apart from cabins, also supplying Company X with steel frames.

Since Supplier 1 supplies two very different components to Company X, they are also organized under two different categories internally at Company X. For both the cabin and steel categories, Company X and Supplier 1, apart from the quarterly meetings, engage in workshops once or twice a year with focus on developing new or improving existing components. Here, Supplier 1 recognizes a big difference between how they work with Company X. In the cabins category, the collaboration on development is deeply rooted and Company X and Supplier 1 does all of the development closely together throughout most of the NPD projects. In contrast, there's hardly any development collaboration between the two when it comes to the steel category. Supplier 1 manufactures according to pre-specified drawings from Company X's R&D department and the development efforts are merely focused on changes to keep the costs down, and rarely on the design itself as is the case with the cabins. This is so because both the sourcing department, which handles the contact with the suppliers, and the R&D department has different individuals that are responsible for different categories and thus set their own strategy for their respective category.

This difference, and since Company X is one of Supplier 1's biggest customers, has led to different priorities for Supplier 1 when it comes to their own operations. For Cabins, Supplier 1 has their own innovation centre solely built for the purpose of constantly being in the forefront of the cabin manufacturing industry which, according to themselves, make them a competitive alternative in that industry. Meanwhile, for the manufacturing of steel frames, Supplier 1 currently has no specific strategy, or dedicated centre, for innovation and do not consider themselves particularly innovative in that industry. They do nevertheless see themselves as extra valuable to Company X due to their extensive knowledge, derived from years of manufacturing Company X's frames, about Company X's products and their business. There are, however, plans on the side of Supplier 1 to expand their steel manufacturing operations to also include an innovation centre.

Overall, Supplier 1 is satisfied with their relationship with Company X but does nevertheless see some room for improvements. The main issues that are brought up are Company X's lack of commitment and the R&D department's conservative view on how development should be managed. It is according to Supplier 1 hard to get Company X to commit to something even though they show a lot of interest, especially when it comes to what to invest on for the future. Supplier 1 also describes cases where Company X reached out to Supplier 1 with development related tasks but then withdrew their desire months into Supplier 1's efforts to meet the need, which naturally created a lot of frustration from Supplier 1's side. The problem with Company X's lack of commitment is that Supplier 1 is hesitant to start developing something new or to go into a collaboration with Company X since they do not know whether Company X will terminate the project or not. It is revealed that the main concern about Supplier 1's plan to expand their steel manufacturing operations to include an innovation centre is if Company X is ready to commit to outsource the development to them if so is the case. Supplier 1 waits idle with their plans for Company to give any sort of commitment or give a hunch of what they want for the future.

"Months into the development Company X suddenly closed the project due to lack of resources. Why did they even want us to start the project then?" - Supplier 1

Whereas Supplier 1 sees other customers and the industry as whole going more towards outsourcing more of the development to suppliers, Company X is perceived as somewhat hindered by their conservative view on keeping much of the development in-house. Although the cabins category has come a long way, there is room for more and the steel category is still very hesitant to include outside development. In addition, a lot of the discussions on NPD are still centered around keeping costs low, rather than optimal performance and differentiation, even in the cabins category. Something that Supplier 1 considers to be one of Company X's biggest flaws. Supplier 1 sees a gap between what Company X's sourcing and R&D department is looking for in a supplier. Sourcing is more positive towards outsourcing more of the development to suppliers while R&D wants to keep as much as possible in-house.

"Company X must think outside the box and dare to channel more resources to projects with a more exploratory nature" - Supplier 1

For the future Supplier 1 want to further extend their relationship with Company X since they do believe that Company X's flaws are something that can be corrected. They see that open relationships with mutual benefit and trust as well as commitment from both sides are crucial for the relationship to be successful. Moreover, Supplier 1 wants to take over more of the development efforts from Company X, especially in the steel category and become a valuable innovation partner to the company. Particularly, Supplier 1 wants Company X to be more open to thinking outside of the box and channeling more resources into coming up with the next big industry advancements instead of focusing on what has always worked. The latter is, in the eyes of Supplier 1, something that Company X must become better at in order to stay on top of competition.

Supplier 2

Supplier 2 is a hydraulics manufacturer and with over 10 000 different components one of Company X's biggest suppliers, when it comes to the number of components that are procured from a single supplier. The relationship began in 2009 as a result of an increased emphasis from Company X regarding component and delivery quality. Supplier 2 was picked due to a proven record of high quality from working with large automotive companies like

Volvo, Scania and Renault as well as other companies within Company X's corporate network. Moreover, Supplier 2 describes themselves as market leaders within their segment and is confident in saying so due to their large customer base of well known companies. To nurture innovation they have their own R&D department that continuously tries to make sure that Supplier 2 has cutting edge technology to offer their customers. Also, to better understand what should be developed and what shouldn't, Supplier 2 regularly goes out to Company X's customers and conducts different types of measurements on the hydraulics equipment. Then follows a report, containing Supplier 2's opinion on what components should be changed and how, for Company X's engineers to review. Supplier 2 describes this as a successful activity but do stress the need for Company X to spend more time reviewing the findings.

There's a great variety in complexity, size and possible use among the components that Supplier 2 is supplying and with it also the amount of development that is performed in-house by Company X, by Supplier 2 themselves or through co-development between the two. Supplier 2 states that this way of working together is perceived as well functioning and appreciated by both parts but do nevertheless leave some room for improvements. First, Supplier 2 would like to be involved earlier in the NPD process and second, they would like Company X's NPD process to stretch over a longer period of time to ensure the right component being developed. Supplier 2 believes that Company X can really benefit from involving them earlier in the NPD process since they have the expertise to act both as main developers but also simply as a sounding board for Company X's engineers. Moreover, Supplier 2 would like to take on more of Company X's in-house development but do understand, and emphasize, that Company X need to keep some of the knowledge in-house to not entirely lose the competence.

"Cost focus is common among our customers, but you don't get the whole picture by just looking at a spreadsheet and comparing costs" - Supplier 2

Supplier 2 supports a close relationship built on openness and win-win attitude between the two parties and believes that an even closer relationship than the one that they have today is needed to cope with future competition. One rather new initiative that they have employed in the collaboration with Company X, which shows how they strive towards a more open relationship, is that of open cost calculations where both parties are fully aware of what costs and margins each component has and what consequences changes to the design will have on the overall price. In contrast to this open price discussion, Supplier 2 brings up the issue of Company X, and many other companies as well, being too focused on cutting costs while missing out on the big picture. Supplier 2 refers to this behavior as "block-thinking" which means that only one aspect, one block, is taken into account while other, often less obvious, aspects are neglected. This "block-thinking" was, according to Supplier 2, what caused them to lose the business they had with Company X's Chinese MAU.

"Our top management and Company X's top management should set goals and expectations for the relationship" - Supplier 2

When asked about why Supplier 2 want to work with Company X they both stress that Company X is one of their most important customers revenue-wise. In addition to that Supplier 2 sees it as a benefit of working with a customer that has so many customized version of their product since that gives them a lot of experience and knowledge which they can apply elsewhere. They do however see some concerns with how the relationship is governed. Today, the category manager and the BL sourcing personnel handles the contact

and agreements with Supplier 2, which sometimes lead to inconsistencies and diverging goals. Supplier 2 would instead like to see that it is the management board at Company X and Supplier 2 that together sets long-term goals that are then communicated down into both organizations. Then, both companies can be more long-term thinking and take their relationship to a higher level.

5 Analysis

In this chapter the empirical findings will be compared to literature. The literature used in this chapter will both come from the theoretical framework but when needed some new sources have been added to further develop the analysis. The chapter is divided into seven subchapters, the subchapters will address the three phases of open innovation: obtain, integrate and commercialize. However the logic of this chapter will not be following this linear model since some issues creates problems concerning more than one of the phases. The first subchapter is an introduction to the overall innovation situation at Company X. The following five will go into depth on the core problems identified. Lastly the sixth subchapter adds some concluding thoughts on issues on outsourcing that are emerging at Company X but are not yet fully distinguishable.

5.1 Distinctive emphasis on lack of innovation efforts

Evident from the empirical findings is that Company X is aware of their lack of innovation efforts and some interviewees even go as far as to say that there is no real structure at all. This can at large be attributed to the short-term focus that has characterized Company X over the last decade which reveals itself in various forms. The primary concern that surfaced from the interviews with the R&D managers was that they simply did not have enough resources to put on innovation efforts. Interestingly though is that, while the R&D managers emphasized the lack of resources, interviewees from other departments saw other underlying issues as the main cause, indicating a discrepancy in how things are perceived at Company X. Outside of the R&D department, the main concern that was raised was not necessarily that the R&D department had too little resources but instead that too much development efforts were kept in-house. Although R&D personnel did not explicitly express the same feeling there were recurring complains over too much time being spent on trivial and repetitive tasks.

These characteristics can be attributed to the principles of closed innovation as outlined by Chesbrough (2003) and further suggests that although Company X has adopted parts of the principles behind open innovation, they are in practice still much colored by a closed innovation strategy. How much of a problem this is for Company X is hard to foresee, but as is emphasized by Boudreau and Lakhani (2013) and Afuah and Tucci (2012), companies need to look outside of their boundaries to stay competitive. Chesbrough (2006) further emphasizes this need by stating that companies can and should use a mix of external and internal innovations when looking to make technological advancements. For Company X, the need to look beyond internal resources for innovation purposes could arguably be reflected in the R&D department's struggle to reach the desired 15% budgeted resources on advanced engineering, or pure innovation efforts, as well as in concerns from interviewed employees and suppliers. Whilst making use of customers as an external source of innovation is a common feature at Company X, using suppliers for the same purpose is not as embedded in the strategy and is only apparent for some component categories. In contrast, Henke and Zhang (2010) recognize suppliers as probably the most important source of innovation and Brem and Tidd (2012) argue that there is hardly anyone else that knows more about a customer's product than its suppliers.

Moreover, West and Bogers (2014) argue that finding and bringing in external sources of innovation is one thing, but integrating and in the end commercializing the innovations are another thing which are crucial to bring any value to the company. Even though Company X is good at managing cross-functional and cross-geographical teams the internal communication for ideation made by suppliers sometimes lacks proper structure. Consequently, moving more towards an open innovation strategy as described by Chesbrough

(2003) might not yield the intended results if proper structure for evaluating and integrating supplier innovations is not in place. Building on the logic of West and Bogers (2014) Company X must recognize both how they should best obtain supplier innovations but also how they should integrate and leverage them into creating value for the company.

5.2 No strangers to open innovation but heritage shines through

The need to leverage suppliers as a source of innovation is recognized by Company X and there are processes in place to nurture innovations coming from suppliers. There is, however, a big difference between different component categories regarding how supplier innovation is handled. Due to the varying complexity of the components and the way the categories are governed some categories display more supplier involvement than others. When Company X has a problem that they need help solving, how much Company X is involved in and can influence the development of supplier components, depends on the type of component and what supplier is supplying it. Some components are tailor-made from the needs of Company X and developed with close collaboration between Company X and the supplier while others are components that have been developed at the supplier without much or any input from Company X. These two different ways of working with suppliers on innovation efforts indicate that Company X exercise different types of coordination and could further be described as project integration coordination and disconnected sub-project coordination, as outlined by Lakemond et al. (2006). Moreover, such a division of supplier involvement also shares similarities with the grey- and black box categorization outlined by Petersen et al (2005), and is a clear separation of the responsibilities of the suppliers and the control that Company X has. Through this strategy, Company X looks to take advantage of their suppliers' innovation capabilities in areas where they consider themselves not having sufficient expertise and must look beyond internal resources. Afuah and Tucci (2012) describes this as a scenario where a company needs to conduct a distant search in which a company can choose to employ designated contracting, selecting a supplier to engage in collaborating on a specific activity with, to expand its development capabilities.

The suppliers that are chosen to either entirely develop the component or to co-develop it with are chosen with basis of Company X's previous experience working with that supplier, what Company X believes are the suppliers' capabilities and expertise and what their proposed solution would look like. Involving suppliers in the NPD process such as Company X is, is recognized by Ragatz et al. (1997) as something that could improve the performance of the company's development process if performed correctly, which according to Petersen et al (2005) is much about choosing the right suppliers to work with. Not as recurring as the factors just mentioned is that the supplier that Company X choose to work with also has the right "innovative mindset", which is described as the supplier having a culture and history of being innovative. The empirical findings shows that this evaluation is done on gut feeling or loosely based on the R&D spend of the supplier. Therefore company X could potentially benefit from using the eight propositions made by Schiele (2006) to get a more structured evaluation of the innovativeness of the supplier. In summary, the selection process of which suppliers Company X aims to work with goes well in lie with the criteria outlined by Petersen et al (2005) but do leave room for Company X to put greater emphasis on the cultural fit and innovativeness of the supplier.

Moreover, Afuah and Tucci (2012) raise the concern of a distant search in and of itself when evaluating potential suppliers to select and work with through designated contracting since it is often associated with increased costs, possibly mitigating the benefit from outsourcing in the first place. This issue is in large recognized by Company X, but more interestingly a

benefit with designated contracting that is not observed by Afuah and Tucci (2012) is lifted by employees at Company X. There are evidently costs associated with evaluating a particular supplier but by evaluating several suppliers and learning of their solutions to the problem Company X not only increases their own knowledge in the field but also opens up the possibility for them to influence the supplier they end up with to incorporate the best parts of every solution they encountered in the evaluation process, much in the same way as Boudreau and Lakhani (2013) emphasis hidden benefits with innovation contests. Moreover, this type of possible recombination of existing know-how into a new component is recognized by Galunic and Rodan (1998) and Khilji et al. (2006) as a step in the process of creating innovation. Through this evaluation process Company X becomes, in some sense, more aware of different ways to solve the problem than the suppliers themselves.

Entirely outsourcing the development of a component to a supplier is rare and only applies to a few, highly complex, components such as engines and transmissions. These components are: (1) too complex and knowledge intensive for Company X to motivate in-house development; (2) supplied by large corporations for which Company X is usually a small spending customer in comparison to others (such as the automotive manufacturers) and; (3) often driven by factors that Company X cannot control such as legislation and industry technological advancements. Innovations stemming from these suppliers are not likely to be exclusive to Company X and therefore offer no guarantee that Company X can leverage these as a competitive advantage when facing industry competition, a concern that is also recognized by West and Gallagher (2006), This does not by any means implicate that Company X should not be doing this, on the contrary, the suppliers of these components are likely to have a proven record of quality as well as a brand that can be used for sales purposes. In addition, Company X can choose to fully outsource the development with exclusive rights to the outcome as described by Chesbrough and Crowther (2006). This does however fundamentally depend on the supplier's willingness to do so, and as of today Company X does not have that agreement with the components they fully outsource. Since Company X is a relatively small customer for many of these companies, such exclusive rights could be hard to negotiate. On the other hand Company X is the leading actor in the industrial machinery industry which could potentially act as an incentive for the suppliers to consider offering exclusive rights, since that could mean enhanced technological advancements in that field. However, as of today, it could be argued that cases where Company X has outsourced the entire development of a component then these situations are aligned with the principles of open innovation framed by Chesbrough (2003). Nevertheless due to the complexity of the components and the impossibility for Company X to do the development themselves, is more of a hygiene factor in the industry, rather than a strategic choice that Company X has made to encompass a more open innovation strategy.

Moreover, it is clear from the interviews that this type of co-development or entire outsourcing through designated contracting is appreciated both by Company X and the suppliers. Yet there remain concerns whether the efforts to become more open is enough to satisfy the needs of Company X. Concerns grounded in the scarce man-hours currently put on internal innovation efforts and the indications from employees and suppliers. The criticism towards the R&D departments "we do it best" mentality is evident both in interviews with company employees as well as with suppliers and could arguably be one of the most important issues that Company X is facing when transitioning into becoming more open to external sources of innovation. This argument is supported by West and Bogers (2014) who emphasis the need of a compatible culture in the R&D organization for successful integration of external innovation. The "we do it best" mentality is recognized as one of the strongest

barriers to external sources of innovation and companies must be aware of this before trying to incorporate such innovations. This mindset is according to Dodgson et al., (2006) and Schiele (2010) not unusual for a company with a history of successful internal R&D but do nevertheless imply cultural change as strongly needed to embrace external sources.

What do speak in favor of Company X possibly moving towards a more lenient approach to using external sources of innovation is the planned construction of the innovation centre for two of the three BLs. With the centre Company X will house all departments under the same roof in an environment that encourages collaboration and thus potentially mitigating the discrepancy between how the different departments perceive how to best work with innovation. Moreover, the formation of a sourcing team dedicated to innovation activities could help lead the way for and involve departments which historically have not been involved much in innovation efforts. There is however a risk with only former sourcing employees being part of the new team since their previous experience might influence the decisions and strategic direction they pursue with (Pisano, 2015). Not all departments should have a fully homogenous perspective on what technology to invest in, on the contrary this would be counterproductive when it comes to nurturing innovation. Instead the purpose should be to align the different perspectives around the same priorities and goals.

5.3 New initiatives do not facilitate discovery of new suppliers

To facilitate supplier innovations that do not originate from a specific problem presented by Company X, the supplier technology days and the walk around workshops is considered particularly interesting due to their similarity with innovation jams, as described by Elerud-Tryde (2016). There are however but some distinctive differences. Both the supplier technology days and the walk around workshops are neither conducted with the help of any online platforms nor is it subject to the interaction between internal employees and lead users. Instead, these activities are managed “on-site” and incorporate the customer, in this case Company X, and its suppliers. The walk around workshop seems to have yielded satisfying results and is likely to be used again if the results from the proposals and quality assurance come back positive.

This activity is however not aimed to bring forth the next big innovation as is the case with the supplier technology days. Although just recently initiated, the results from the first supplier technology day raised some concerns regarding what is to expect for the future. If what was mentioned is in fact the reality, that the reason for not being able to bring out satisfactory new innovations from the suppliers is due to a gap between what Company X think they are asking for and what suppliers think they should be focusing on, there’s a risk that the upcoming supplier technology days will suffer from the same fate. While still being an important factor to consider, a too heavy cost focus risks deterring the suppliers from investing in the development of more game changing innovations. It is however too early to tell if the supplier technology days will be a successful initiative or not, but what is apparent from the first attempt is that it is paramount for Company X to clearly communicate the purpose of the activity in order to achieve the intended results. Regardless though, both initiatives are highly appreciated internally by Company X’s employees and demonstrates Company X’s willingness to support a more open innovation strategy.

The activities discussed so far have solely been directed at existing suppliers, handpicked by Company X on the basis of their past and predicted future performance, leaving out the opportunity for new suppliers to present themselves in this arena. New suppliers are instead discovered through other activities such as industry expos, corporate group networks and

individuals doing their own research. The choice of whether to pursue further contact with a new supplier that Company X has come in contact with or not rests on the individual's intuition and experience regarding what the supplier is most likely to be able to perform. Also, it is clear that there's no standardized process for the discovery of new suppliers and it is understood that much instead comes down to the willingness and ability of the category managers to drive this. Moreover, Company X's current suppliers, those are subject to be selected for designated contracting, might not always be the best choice available and/or have the best solutions available. This insight is however more applicable to some categories than others due to the nature of the components and the availability of the suppliers that are supplying it. Regardless though, Company X risks losing out on a lot of good innovative suppliers that are willing to, and capable of, driving innovation together with the firm.

5.4 Unilateral focus risks overshadowing potential sources of innovation

What has been discussed so far is how Company X utilizes suppliers in their innovation efforts, but correlating with the risk of overlooking innovative suppliers due to lack of standardized processes and that the risk of trying to find new suppliers is the danger of foregoing great ideas that might not originate from other companies at all. Considering Company X this could mean interacting with universities, and individuals from the crowd, for sources of innovation. The former has already been noticed by Company X and there are plans to engage in collaboration activities with universities while the latter is still somewhat undiscovered.

There are several cases of companies that have relied on the crowd for sources of innovation and succeeded by doing so (Brabham, 2008). Although the supplier technology days and the walk around workshops could be described as crowdsourcing activities with trusted partners as outlined by Simula and Vuori (2012), they too only target existing suppliers and the concept of using the crowd is still not exercised at Company X. Crowdsourcing might at first sound strange to Company X since they do not have any manufacturing of components themselves and thus cannot simply take a solution from the crowd and then manufacture the component. Instead, Company X can potentially acquire a solution that is superior to what either new or existing suppliers could come up with and then take this solution to a supplier that they believe can best realize it, much like they do with components that have been internally developed. As such, crowdsourcing is considered to fit the way that Company X is working today. Afuah and Tucci (2012) and Boudreau and Lakhani (2013) also emphasize that crowdsourcing is not only applicable to situations where a specific problems needs to be solved but methods such as innovation contests can also be used efficiently for simply scanning the market for viable new technologies.

With that said, Company X, or any other company, should not by any means rush into applying the logic of crowdsourcing on everything, on the contrary a company should be cautious with what methods they choose to use depending on the situation (Afuah and Tucci, 2012). This is especially true since the component categories within Company X is very different from one another, and so are the BLs, and would require different methods. Take the engines category for one, where there are basically two manufactures in the world, or transmissions to mention another where the same logic applies. For these categories Company X has little to none influence over what is developed and crowdsourcing would not make much sense at all, while other categories, such as steel, could really benefit from this method. It is therefore essential for Company X to evaluate whether a certain problem can best be solved internally, through designated contracting or through crowdsourcing. In addition, when scanning for new, yet to be discovered, technologies and suppliers, crowdsourcing is not

suitable for all component categories. Thus, the existing methods should therefore not be considered obsolete, but instead crowdsourcing should be thought of as a good complement to expand Company X's boundaries. Moreover, the very nature of crowdsourcing requires a well functioning platform to facilitate the integration of different solutions, something that Company X lack today. Boudreau and Lakhani (2013) do however emphasize that the absence of crowdsourcing methods indicates that a company is most likely overlooking a lot of good ideas which further supports that it would be of great value for Company X to implement such methods.

Determining whether to internally develop something, to use designated contracting or to employ crowdsourcing Afuah and Tucci (2012) five factor model could prove to be particularly useful to Company X. An initial evaluation of the problem that Company X is facing on the basis of Afuah and Tucci's (2012) model could help determine if a problem is best solved in-house or through outsourcing, and if the latter is the case, also indicate how the outsourcing should be conducted. The model effectively accounts for the difference in complexity between the different component categories and could be used independent from which BL is concerned. If Company X would be hesitant to implement crowdsourcing, the model would still be useful in determining what, and what should not, be outsourced through designated contracting. However, with crowdsourcing implemented, Company X will have a third option to solving a problem and a novel way to find innovative suppliers and would thus potentially mitigate the risk of foregoing innovative ideas.

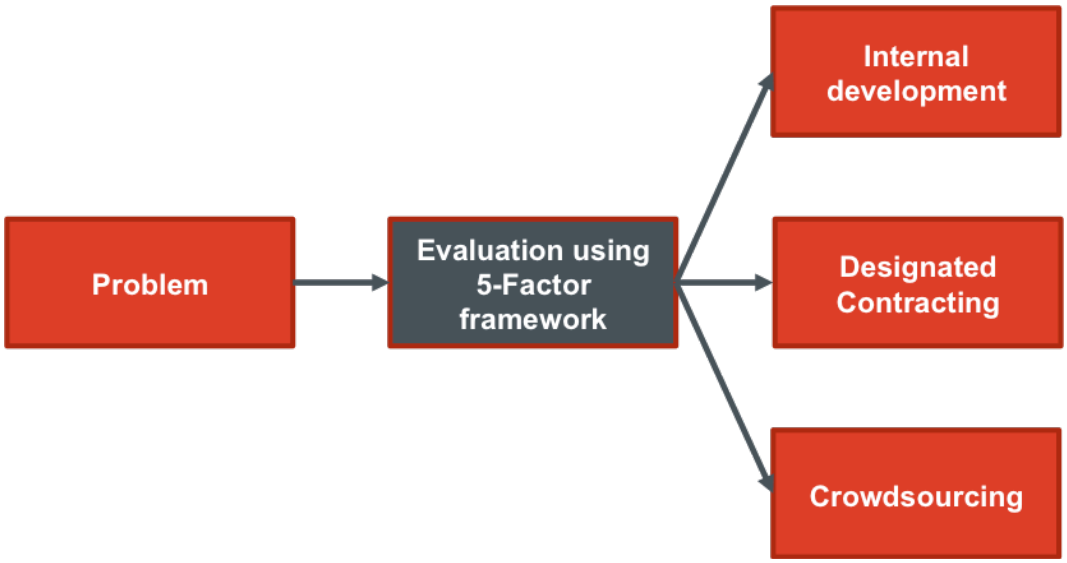

Figure 5.1 Suggestion for how Company X can use the 5-factor framework

For the purpose of using crowdsourcing as a method of solving a specific problem or scanning the market for new technologies, innovation contests, as described by Terwiesch and Xu (2008) and Boudreau and Lakhani (2013), is considered a good fit. Innovation contests are described as the most straightforward method of crowdsourcing and since various numbers of problems or projects can benefit from the use it, it is deemed to align well with the differences between Company X's component categories. In addition to engaging the crowd in the problem solving, an innovation contest could also be directed to firms (Terwiesch and Ulrich, 2009) and then act as a source of finding new suppliers for Company X. Therefore, an innovation contest could arguably bring two different benefits for Company X. One being that

they get fed a number of different solutions to a problem that they can leverage and the other one being that they open up the opportunity to get in contact with new, possibly previously unknown, suppliers. But as is stressed in the literature, the structure of the innovation contests plays a key role in how successful it will turn out to be for Company X (Terwiesch and Ulrich, 2009; Terwiesch and Xu, 2008; Boudreau and Lakhani, 2013).

Another method of crowdsourcing that is particularly interesting, when considering the issues that Company X is facing, is that of crowd labor markets described by Boudreau and Lakhani (2013). The trivial and repetitive tasks causing frustration at the R&D department goes well in line with what Boudreau and Lakhani (2013) argue are the most suitable tasks for using crowd labor markets. Although not directly tied to an innovation activity on its own, using crowd labor for trivial and repetitive tasks could potentially free up time for the R&D personnel to work on more value adding activities such as advanced engineering. Apart from the more obvious use just mentioned, crowd labor markets could also be used for more complex tasks as well and should therefore be considered a more easily managed alternative to innovation contests (Boudreau and Lakhani, 2013).

5.5 Unstructured evaluation process leaves room for avoidable mistakes

One of the most pressing challenges a company employing external sources of innovation is facing is that of evaluating which innovation is most likely to bring value to the firm (West and Bogers (2014). In the case of Company X before an idea reaches the development phase it has to go through several stages of evaluation, in which the PPMs serve as the highest instance. Here Company X has successfully incorporated the use of cross-functional teams to secure that the idea is valid in all aspects of the business, as described by Sethi et al. (2001). There are however flaws with the earlier stages of the evaluation process, before an external idea reaches the PPM.

Today initial evaluation of ideas are conducted by the department that receives it, be it sourcing, R&D, sales or any other department, before it is passed to the R&D department, assuming they were not the initial receiver/source, for further evaluation. The initial evaluation is thus based on the individual's personal knowledge and judgment rather than following a standardized evaluation process. Thus ideas can be killed off or forwarded without any proper evaluation from several internal sources. There is also a difference between ideas coming from customers and ideas coming from suppliers where customer ideas are always received at the sales department while suppliers, in particular new ones, have no clear contact point for where ideas can be communicated. Furthermore, individuals handling the initial evaluation could be described as some sort of gatekeepers, as someone who has the power to decide if the idea should be abandoned or not, in the evaluation process which goes well in line with Ettlie and Elsenbach (2007) argument that companies relying on employees for evaluation have an increasingly shared and distributed gatekeeper role. The difference though is at Company X these gatekeeper roles are not official and employees are most likely unaware that they are in fact acting as gatekeepers. Therefore. ideas might end up at the wrong or an unknowing person for initial evaluation as there’s no specific person at the different departments that is responsible for handling incoming ideas.

Moreover, in contrast to ideas coming from suppliers or internally, ideas coming from customers already have a somewhat proven commercial viability, which naturally is an important factor for Company X. Judging from Drucker (1985) who emphasize that innovation must always be close to the market, focused on the market, and market driven, one could argue that the upfront evaluation of commercial viability that is done at the sales

department is in some cases perhaps even more important than the technical evaluation. Therefore, ideas stemming from other sources than customers are arguably even more important to accurately evaluate. It is however not until the idea reaches the PPMs that they are properly evaluated by several different departments and then they will be colored by which path they took to get there, i.e. sourcing will favor cost and R&D technical performance. As such, even though the PPM is an arena in which ideas are meant to be evaluated by cross-functional teams, they are in fact already evaluated by a single or a few departments or individuals before they even reach the PPM. This lack of proper evaluation risks letting good ideas slip by, or bad ideas being forwarded for further evaluation requiring more resources even though they could, and possibly should, have been disregarded initially. One could therefore argue that the evaluation process lets individuals subjectivity interfere with a, at first glance, well thought-off evaluation process. This is problematic since different departments are likely to have different priorities and objectives (Pisano, 2015). In addition, ideas that do make it through the initial evaluation and is forwarded to the R&D department risks getting lost because there is no standardized process in place to facilitate the transmission from one department to another, nor is there any process for where ideas should be stored.

Irrespective of the level of structure on the evaluation process applying a more open innovation approach might require other tools for evaluation and illustration of ideas (Dodgson et al., 2006). What Dogson et al. (2006) refers to as innovation technology (i.e. data mining, simulation, prototyping and visual representation) are tools which can support the innovation process. Company X is already using some of these tools such as modeling programs for prototyping, but lack tools for idea storing and sharing. Even simpler tools such as internet based platforms for file sharing (i.e. Google Drive, Dropbox etc) could potentially be a facilitating tool for knowledge sharing from different suppliers. By storing and sharing supplier ideas in shared files and docs, knowledge about capabilities and opportunities could become more transparent and easily available. Such tools for idea and knowledge sharing amongst the personnel of the organization have been discussed in literature. The results from these studies are that the problem with knowledge sharing emanates partly from the fact that people are reluctant to share their own ideas but also because it is hard to describe an idea in text (McDermott, 1999). Since supplier ideas are external sharing them might seem like less of a sacrifice for the person communicating the idea. However making time for this kind of activity would potentially require time set aside for innovation activities or creating incentives to share. Also making sure that the process of sharing is simple will be important for integrating the supplier innovation sharing in the day to day operations.

5.6 Cost focus over extended relationship building

One key issue of using external sources of innovation is that regardless of how much a company wants to use external sources, the external sources themselves must have some incentives to engage in such a collaboration. Here, Terwiesch and Xu (2008) raise the method of using extrinsic motivation such as monetary rewards while West and Gallagher (2006) stress that intrinsic motivation, e.g. recognition or learning a new skill, could also be an incentive. From the empirical findings it is clear that Company X would like to be perceived as a company that values open long-term relationships with mutual trust and benefits, which could arguably mean that suppliers should be interested in working with Company X. Not only to due to the additional revenue stream, but because of intrinsic motivation, such as positive associations from working with Company X and the opportunity to advance their own R&D capabilities through joint development. The suppliers interviewed for this thesis did however express that Company X are not investing enough in the mutual relationship.

Even one of the most integral supplier mentioned several occasions when Company X treated them with an arms-length distance or even canceled initiated projects without reasonable explanations. Lack of commitment from Company X's side was highlighted as one of the main issues from the suppliers' perspective and deterred them from making investments on their own to facilitate Company X's needs. Therefore it is argued that Company X's ambition of creating intrinsic motivation is not mirrored in what activities are actually executed.

The aspiration to become the customer of choice through openness and win-win mindset is in conflict with the dual sourcing strategy in place and the seemingly heavy focus on cost rather than technological advancements. This is further supported from the interviews with suppliers in which they emphasis the need for Company X to think less of cost and more of technological performance. Moreover, to foster a beneficial relationship it is paramount that all parts of the organization works towards the same goal, which is why the dual sourcing strategy could be seen as counterproductive in creating closer relationships. This issue is particularly evident in scenarios described in which the R&D department and the sourcing department have opposite views on which suppliers to work with. There have been several cases where Company X has ended a long lasting relationship on the basis of lowering the cost but at the cost of frustration from the R&D department since they lost a long-term reliable partner. This is recognized by both of the interviewed suppliers, both supplying crucial components and is involved in close relationships with Company X. One of the suppliers lost the contract on co-developing the frame, and was not even invited for discussions, at the same time as they are currently co-developing the Cabin with Company X. For the supplier, this naturally led to frustration that could potentially damage the development of the Cabin. The same frustration was present for the other supplier that lost the business in China while still in development projects elsewhere.

Since trust is considered one of the most important factors for successful outsourcing (Hoecht and Trott, 2006) this behavior of neglecting suppliers without a thorough explanation could potentially increase the risks of co-development. One of the most vital risks with strategic outsourcing is the risk of information leakage (Hoecht and Trott, 2006). The interest the supplier has in repeat dealings, tightening contracts with the supplier or acquiring stakes in the supplier company are all potential solutions besides that of trust. However Hoecht and Trott (2006) argue that these ways of mitigating the risk of information leakage is either too weak or too costly. Thus having a close relationship based on trust is thus crucial for Company X. This implies that Company X's cost focus could lead to consequences they did not consider.

In addition, the fact that some sourcing managers are ignoring the dual sourcing strategy implies both that the rule in itself is not as beneficial or as widespread as top management believes and/or that the organization is not completely aligned in the way that they are working with suppliers. The implications of this is highlighted by Takeishi (2001) who states that the internal coordination is essential to create the external coordination needed to successfully incorporate suppliers in new product development. The Supplier Development department is another indication that the firm understands on a strategic level that they need to enhance their supplier network in order to stay competitive. However when speaking to managers and employees the overall impression is that the awareness is there, but the operational actions are disperse.

When interviewing one of the category manager it is apparent that a lot of the resistance from working differently with suppliers came down to how cost efficiency and success are measured at the firm. The sourcing department does have a lot of power when it comes to

working with suppliers. Since they are still reviewed based on cost incentives solely, there is a potential mismatch between the transitioning from adversarial to collaborative relationships. Moreover, how to measure and track progress is an important parameter in which result you get (Croll and Yoskovitz, 2013). If Company X wants to work more closely with suppliers and create a more innovative collaboration, objectives and goals must be set likewise. Metrics should track what you want to measure, they should be understandable and not just inform (i.e. vanity metrics) but be actionable (Croll and Yoskovitz, 2013). Using the right metric will make it possible for Company X to change the way they behave. For examples, using ratios rather than actual numbers will be a good way to understand causation and take actions going forward (Croll and Yoskovitz, 2013). This does however not mean that standard accounting metrics can't be beneficial, but when trying to track innovation and make actual changes to the business models often requires the use of other performance metrics.

Moreover some interviewees expressed technology sharing as one part of the problem with an extended supplier relationship. As in the case with Procter and Gamble (Dodgson et al., 2006) open innovation requires and benefits from using new tools such as simulation, modeling, big data etc. Company X are already using some of these tools however a mutual collaboration requires that the selected suppliers are using those tools as well or that Company X are willing to invest in the tools used by the supplier. Investing in a relationship will initially be costly and when transitioning from an adversarial approach these costs can seem overwhelming and therefore risk being rejected.

These problems mentioned above seem to derive in part from the lack of alignment between different departments but also because an overall strategic plan for suppliers is not integrated in the day-to-day operations. Working closely with suppliers requires more than just the intention to do so, it requires actual efforts and sacrifices both in time and in money. What do however speak in favor of Company X potentially overcoming these hurdles is the enhanced supplier relationships initiative, with the purpose to take supplier relationships to the next level. As of today there are only two suppliers that have been selected to participate in this initiative and it is too soon to tell if this would actually mean that Company X's strategy would in fact be reflected in their day-to-day operations or if it would remain inconsistent.

5.7 More does not always equal better

What has not yet been discussed is to what extent a company should employ open innovation over closed innovation. Chesbrough (2003) emphasis a mix between the two but give no clear guidance of what is too much or too little. There must be a coherent plan to which activities should be performed externally and which should be kept in-house. Afuah and Tucci (2012) treat the decision with regards to each specific activity that is to be performed but don't signal when enough is enough, when something should be kept in-house even if the five factor model says otherwise.

As in the case of the car manufacturer Alpha studied by Zirpoli and Becker (2011) the risk is also that too much of the new product development is outsourced creating a situation when managing the supplier base generates more costs than the actual gains by using external resources. When looking at the extent of outsourcing in production, manufacturing and NPD processes over time at Company X the trend seem to be increased outsourcing without having an overall structured process nor a strategic plan. Since the supplier base together with the firm creates the entity of competition against other firms, Company X being the customer of choice for suppliers as well has having suppliers which supplements each other are integral. By focusing on long-term relationships, as mentioned above, as well as the right motivating

factors, Company X could create a competitive portfolio of suppliers. By doing that they could ensure that they are not only producing the same results as everyone else, one of the risks with using external sources of innovation, but instead create a network-based competitive advantage.

Another risk with too much open innovation and outsourcing of new product development is that the loss of internal knowledge becomes to big (Brusoni, 2001). This concern is evident when observing the automotive industry (Peterson et al., 2005). This loss of internal knowledge was a tough lesson since it took a substantial amount of funds and resources to recover from. However, it is still argued that outsourcing on the component level is motivated in that these parts are less knowledge intensive and thus less important for the firm (Zirpoli and Becker, 2011). Yet, since innovation is largely based on creativity, which in turn often requires a thorough understanding of the entire system, outsourcing too much of the component-level work could be dangerous. To avoid this problem it is suggested that some components are treated as more integral than others, and that these should be developed in-house. Components that Company X consider to have a direct effect on the performance and/or present a high degree of interdependence with important technology, in turn contributing to the total performance, should be developed in-house. Therefore R&D personnel cannot, and should not, be completely disregarded when expressing some reluctance to the outsourcing of internal development tasks.

The balance between what should be developed in-house and what should be designed externally is important but how the balance should look like is not by any means obvious. Company X does however have the advantage to benchmark themselves to other industries which have transitioned from 100% in-house development to a more open innovation approach. As Rothaermel and Alexandre (2009) concluded, after studying 141 manufacturing firms in the U.S., the optimal financial performance comes from a mix of 61% external and 39% internal sourcing. In contrast, Pisano (2009) argues that each company's innovation strategy must be specifically tailored for that particular company, which implies that even though these figures have some empirical value they should merely be treated as indicators rather than figures to blindly follow.

In summary, it has been argued that Company X has not yet fully embraced the principles of open innovation and understood the implications that it will have. The resistance, mainly from the R&D department, towards sourcing more of the development to suppliers has been identified as one of the main issues that Company X has to deal with. Moreover, the ambiguous message that Company X sends with their heavy cost focus might deter suppliers from wanting to invest in a closer, and more collaborative on innovation efforts, relationship. This ambiguity may also undermine other activities put in place to accommodate more supplier involvement and encourage new suppliers to come to Company X with their innovations. Lastly, even though Company X arguably is far from overstepping the balance towards too much external development, they must be aware of the risks of losing too much critical knowledge. As is, Company X has a journey ahead of them before they can effectively facilitate the use of external sources of innovation.

6 Recommendation

From the empirical findings and the analysis it is clear that Company X is not as innovative as they would like to be. Being a company that strives to remain the market leader in technology puts great emphasis on innovation efforts and as of today Company X cannot satisfy this need. Therefore, it is argued that Company X must make innovation the backbone of their business strategy and to achieve this they have a number of things they will have to consider. This recommendation will partly have more of a conceptual nature and emphasize what Company X should have in mind moving forward and partly be more concrete actions that can be undertaken right away.

6.1 Embracing external sources of innovation

Both internal employees outside of the R&D department and the suppliers that were interviewed stressed that Company X's R&D department has a mindset that somewhat opposes the use of external sources of innovation. Regardless of what Company X do to facilitate a more open innovation approach, this culture of "we do it best" will most unlikely undermine all attempts. Moreover, the discrepancy between different departments regarding how to best work with innovation and with what suppliers to work with is an obstacle that must be managed. Thus, the very existence of an open innovation strategy at Company X partly relies on a more lenient attitude from the R&D department towards employing external sources of innovation, and partly on aligning different departments' perspective on how to best work with innovation. Before this issues are resolved, beginning to look at more concrete options to bring in more external innovation into the organization could be a hard thing to achieve. In light of this, cultural change and alignment between different departments must become Company X's primary concern moving forward.

For this purpose, the planned innovation centre will most likely serve as an excellent facilitator, if leveraged correctly. Especially the formation of the new sourcing group with emphasis on innovation is interesting since this group could act as some sort of change agents for the rest of the organization, driving the work and encouraging other employees to think innovation. Moreover, in contrast to being located in different buildings, housing all departments under the same roof will make it more natural for different departments to communicate and exchange experiences from their respective disciplines. This in turn could align how employees from different departments perceive how Company X should work with innovation. In addition, the adjacent prototype workshop, with one expressed purpose to be a stage where supplier, and other, ideas are tested, can help communicate Company X's innovativeness to outside actors, and perhaps make Company X a more attractive company to do business with. Moreover, another dimension of the innovation centre, perhaps less obvious is the fact that the name innovation centre itself could help change the company identity.

However, although the innovation centre could potentially reduce "we do it best" attitude, other measures have to be taken to earn the R&D department's full support. What is important here is to educate the R&D department about the benefits of them having more time to spend on projects, such as advanced engineering, and stress that outsourcing the development does not necessarily mean entirely losing control. The R&D department might feel the need to secure enough internal knowledge to understand all parts of the product, and drawing from the conclusions in the analysis that is a reasonable worry. This balance between what should be developed in-house and what should be developed externally is unique and must be specifically tailored for each company. Therefore, the board of management at Company X should leverage the skills from the R&D department to find a good ratio, making sure that they are not losing control over key components or that the internal knowledge is diluted.

Integrating the R&D department in this process could also mitigate the initial feeling of worry and incorporate a sense of control when implementing a more open innovation strategy.

Making innovation the backbone of Company X's identity is crucial, given that they want to be the market leader both in terms of creativeness and innovativeness. The two actions described above could potentially be a step forward in this quest, although changing the identity of a company requires a lot more. Foremost, all decisions and policies must lead in the same direction, which in turn demand that all managers on different levels have the same understanding on what the company should become going forward. Nonetheless, if they succeed in doing so Company X can begin to consider what else they can do to facilitate a more open approach to innovation and these actions will be described here under.

6.2 Strengthened process of discovering new suppliers

As was stated in the analysis Company X currently have no standardized ways of discovering new suppliers and much comes down to ad hoc solutions and the willingness of the category managers. Attending industry expos, researching the corporate group network and browsing the internet are not considered pointless, but do leave room for other complementing, and possibly more standardized and regularly recurring, methods. First, the already implemented supplier technology days and walk around workshops are great tools to capture supplier innovation, but as of today these are only directed at existing suppliers. Moreover, the first supplier technology days activity did not yield any winner in the "most innovative supplier" category, which indicates that the purpose of the activity must be more clearly communicated.

Although these two activities currently only include existing suppliers, the nature of them makes it possible for Company X to also invite new suppliers. Therefore, it is recommended for Company X to keep the supplier technology days and walk around workshops and invite, beyond the core suppliers that are planned to be present today, new suppliers as well. Depending on the category and/or the resources available to facilitate the activities this could be either one or more new suppliers. The suppliers that are invited could be suppliers that Company X have come in contact with through previously used supplier discovery methods, but adding the opportunity for the supplier to really show what they can do. The two activities can be reoccurring, perhaps every year or every other year, and the participating suppliers could change depending on how they have historically performed or, considering new ones, on the basis of which suppliers are of greatest interest to get to know better. Making the activities reoccurring and standardized across all categories, with the exception of possibly not finding new suppliers to invite in e.g. engine and transmission categories, will not only expose Company X of a regular inflow of supplier ideas but also put pressure on the category managers that have historically not been as active. This should, however, only be the case as long as Company X perceives the activities to be fruitful and actually bring value to the company. Finally, innovation contests, as was described in the analysis, could also serve as an arena in which new suppliers can demonstrate their capabilities. More on how Company X can and should form these will be presented in chapter 6.3.

Lastly, innovativeness was highlighted as one important aspect to consider when choosing which suppliers to work with, and becomes highly relevant especially for the discovery of new suppliers that Company X possibly have no prior history with. Therefore, Company X is also recommended to employ the eight propositions outlined by Schiele (2006) both when evaluating new suppliers but also with regards to their existing ones. This method could reveal if existing suppliers really are as innovative as is believed and if a new supplier has indications that they are likely to become a game changer in their industry.

6.3 Shift to a multilateral focus for additional sources of innovation

From the analysis it can be argued that Company X has not yet explored the possibility to use external sources beyond that of customers and suppliers in their innovation efforts. Universities and engineering companies were mentioned as possible sources that Company X themselves have begun looking into and the method of using the crowd was brought up as an alternative that has not yet been on Company X's radar. It is recommended that Company X look further into collaboration with universities and engineering companies and that they look into the possibility to use crowdsourcing.

When Company X is faced with a problem they need to solve, be it a particular component they want to develop or when they merely need inspiration, they could use crowdsourcing methods. Successfully using crowdsourcing does however come with a lot of premeditation and the method is far from applicable to all scenarios. Therefore, Company X is recommended to evaluate each new problem they face with the basis of the five factors mentioned by Afuah and Tucci (2012). With the five factors framework Company X can determine whether a problem should be kept in-house, outsourced to a supplier or sourced to the crowd, and thus bring value to the company ever before any crowdsourcing methods is implemented.

For Company X, innovation contests are considered the most viable alternative when it comes to crowdsourcing since it accounts for different needs as well as many of the differences between Company X's categories. Innovation contests could also both include individuals from the crowd and suppliers, or other entities, and would thus also open up the opportunity to discover new suppliers. However, as was described in the analysis an innovation contest do however come with a lot of considerations.

Since crowdsourcing and innovation contests are new phenomenon to Company X an intermediary is recommended to facilitate the contests, this is however only possible if such an intermediary is available for the industry in which Company X is operating. An intermediary could also help broker the IP rights, expand the reach of the contest, and remove other costs associated with doing things in-house. Thus, the cost of using an intermediary is considered mitigated or accounted for by the benefits it brings for Company X. Furthermore, a free entry competition and is advised to encourage smaller actors to participate as well. The number of allowed participants should be a function of the resources available to evaluate the solutions that are submitted and the evaluation itself should include cross-functional teams to ensure commercial, technical as well as sourcing viability. Moreover, the performance contingent award-allocation structure is recommended since it is considered to create the highest incentives for the participants. The award must however not necessarily be monetary. If Company X is targeting only suppliers with the contest, a promise of a certain volume to be purchased from that supplier if their solution wins or an invitation to participate on the development of other components could act as an award. In addition, a less obvious incentive for suppliers to participate is that of simply doing business with Company X could motivate suppliers to make an effort. From the empirical findings it is evident that Company X sees themselves as the market leader and an innovative company that strives to be in the forefront of technology, something that is in part confirmed through the interviews with their current suppliers. As such, Company X seems to be able to offer an incentive beyond that of an award and should stress this when advertising a potential contest.

Company X must however be cautious when implementing crowdsourcing. Evaluating the problem beforehand on the basis of the five factors becomes of very high importance since not all categories are suited for crowdsourcing. Complex categories with very few possible solvers such as engines and transmissions are probably not categories for which Company X should use crowdsourcing. Finally, Company X is recommended to investigate how the use of crowd labor markets can help with relieving the R&D department from some of the more standardized and repetitive tasks they currently have.

6.4 Have a semi-structured and front end focused evaluation process

Both when it comes to capturing supplier ideas as well as when determining the value of the same, Company X has room for improvements. The identified lack of a standardized procedures creates a situation potentially leading to the loss of valuable innovations. Nonetheless, some parts of the evaluation work at Company X are well grounded in current literature, for example the use of cross-functional teams at the PPM. However, drawing on conclusions from the analysis it seems like these cross-functional meetings are introduced too late in the process. Therefore Company X is recommended to move the cross-functional idea evaluation to the front end accompanied by a semi-structured evaluation process.

Today one category within the company has already begun this shift by storing ideas in a shared document. The suggestion for Company X going forward would be to build upon this initiative and structure a supplier idea platform. Instead of waiting for the idea to go through several gatekeepers before possibly reaching a PPM each employee should have the responsibility to share new supplier ideas in a document using a predefined form. Some of the predefined headlines included in this form could be based on the criteria mentioned in Figure 2.4 and further described in subchapter 6.2. Also, as mentioned by employees at Company X as well as by Petersen et al. (2005), information on the supplier such as perceived company culture and competencies could be included.

This new responsibility would mean that all employees take on the role as a some kind of "*gatestorers*". Since Company X has changed from Microsoft Office to Google G Suite it seems natural that the company would use Google Docs for such file sharing. Some might argue that a more tailored platform specifically created for sharing ideas would be necessary. However, it can also be argued that using easily accessible tools already familiar to the employees would be more viable, especially since the company is just on the starting blocks for a more open innovation strategy. Regardless of what tool is used, making sure that the right security measures are in place to protect idea theft will be of high importance for Company X moving forward.

Figure 6.1 Alternative evaluation process

The next step would then be to evaluate the ideas in the Google Docs. The recommendation for Company X would be to have innovation agents (IA) in each department that is normally represented at the PPM. The innovation agents should be given a twofold responsibility, both to proactively work with implementing the innovation culture at Company X but also to manage the idea platform. They could for example score the ideas using the comment

function in Google Drive, or through the spreadsheet function, and only the ones with enough score would transition to what will hereafter be called Innovation Agent Meetings (IAM). These meetings could be similar to the PPM evaluation. However the focus here would be to create an initial concept focusing on the business potential of the idea. The initial technical evaluation from R&D would be included in the IAM and performed by the IA representative from the R&D department.

The intention would however not be to remove the PPM. The recommendation is that these agents are skilled employees rather than managers, which is why the PPM would still be included in the process but more as an executive body. Moreover, the agents should still have a line role at their respective the department to not lose the connection to what factors are essential when evaluating an idea, but still have time set aside from their line role to work with the new role. Moreover, the IAs must be given the right authority to make decisions and have the recognition within the company to enable them to drive the cultural change. An illustration of the suggested idea evaluation process can be seen in Figure 6.1.

6.5 Long-term cost consciousness instead of short-term price cuts

How a company makes money could potentially determine the actual identity of the firm. In this case Company X wants to be perceived as an innovative player, which is why the focus must stretch beyond that of short-term price cuts. Since the sourcing department is Company X's extension towards suppliers what they currently are measured on could pose a problem. The dual sourcing strategy implemented today is an example of such a measure. Therefore it is recommended that Company X change the sourcing department's objectives and goal to better align with what the company wants to achieve. This recommendation will not go into detail on which exact measures to use. Nonetheless the literature presented in the analysis provides some general guidelines, such as using actionable ratios, which are easily understandable, as well as measuring success over longer periods of time.

Another aspect connected to cost is the reluctance from Company X to invest in the software used by some suppliers. This reluctance is not entirely uncalled for, spending frivolously on IT does not make any sense from a cost perspective when switching suppliers quite regularly is a part of your business strategy. However if Company X implement a more open innovation strategy, working closely with suppliers, they could gain from investing in tools used by the supplier. Therefore the recommendation will be that Company X introduces a more generous attitude towards key supplier since that could lead to more profits in the long run.

Furthermore, it is recommended that Company X continue the initiative with enhanced supplier relationships. This work could both benefit the company in terms of successful outsourcing of development as well as conveying a message to the rest of the organization that suppliers are indeed to be trusted. Since trust, mutual benefits and mutual conversation often are mentioned as cornerstones for every relationship, be it business or everyday life, there should be a heavy focus to secure these three aspects. Being honest with the supplier, by using a open book price discussion, or trusting the supplier, by inviting them early on in the NPD process, as well as making sure that the dialogue is positive and supportive are all examples for how to intrinsically motivate the supplier, hence creating a better collaboration. A relationship based on could also decrease the risk of information leakage as discussed by Hoecht and Trott (2006).

6.6 There is no value in excess

As was argued under subchapter 6.1 and in the analysis there is no such thing as a set ratio when it comes to finding an optimal level of outsourcing vs. in-house development. When transitioning towards becoming increasingly reliant on external sources it is therefore recommended to have an outsourcing strategy rather than taking ad hoc decisions. This strategy is however hard to predetermine, which is why it is suggested that Company X take deliberate and evaluated steps towards a more open approach, meaning that tasks should not be outsourced without thorough analysis of the consequences. By doing so, Company X will hopefully mitigate the risk of diluting internal knowledge and/or avoid the cost associated with excessive outsourcing.

7 Conclusions

In this chapter the research questions will be answered in short, one by one, to give the reader a summary over the overall results.

What are the current processes for capturing supplier innovation at Company X?

It is evident that Company X already has some processes in place to capture supplier innovations. Some components' development are already either fully outsourced to, or developed in collaboration with, a supplier. Moreover, supplier technology days and walk around workshops are two newer initiatives put in place to learn of new innovative ideas from their existing suppliers. Discovering new suppliers to work with is a non-standardized process which may include attending industry expos, utilizing the corporate group network or simply individuals doing their own research through googling. The non-standardized process means that it comes down to the category managers themselves to drive the discovery which means that the success and frequency of these activities are subject to the individual's alacrity and willingness to invest time.

At first glance the idea evaluation process at Company X seems to be well structured to filter out the best possible ideas, but a more thorough analysis reveals that there are some flaws that could potentially be harmful. The evaluation at the cross-functional PPMs takes place further down the evaluation process at a stage where single or a few individuals or departments have already made a decision about the ideas viability. The individuals that have made those decisions could be anyone at any department, and it is their individual opinion that sometimes determines whether an idea should be forwarded down the evaluation process or not. This is identified as particularly harmful to ideas that comes rather ad hoc from external sources other than customers, since ideas from customers already have been commercially evaluated upfront. In addition, ideas that stems from sources, besides that of customers, often do not have a clear contact point for where at Company X they should first be communicated, and many ideas end up at the wrong person and/or is disregarded without any proper evaluation.

How can Company X better leverage suppliers as a source of innovation?

A number of different things have been identified that could help improve Company X leveraging suppliers as a source of innovation. Foremost, and arguably Company X's biggest concern, is the resistance, present primarily within the R&D department, towards employing external sources of innovation. Without the support of the internal R&D department, attempts to foster increased emphasis on external sources of innovation will be suboptimal. Therefore, the board of management must communicate the benefits and ease of workload that extended use of suppliers as a source of external innovation can bring. However, not only the R&D department is in need of change. The whole organization must align their view on how innovation should be perceived and what activities should be executed. Here, the innovation centre that is under construction will most likely play a key role in bringing together different departments, which is why Company X must leverage the opportunities that are presented with it.

In addition, the heavy cost focus and short-term profit thinking are also considered obstacles in successfully integrating suppliers for long-term relationships and utilization of external innovation capabilities. Especially the sourcing department has a paradoxical focus where they stress the need to find the most innovative suppliers but still have the dual-sourcing strategy and focus on cost. Thus, Company X sends mixed signals to the suppliers, which in turn is afraid to commit due to uncertainty of what Company X really wants. Part of this is because the sourcing department is both considered to be one of the main drivers of

innovation while they still are measured and evaluated on the basis of cost savings. As a consequence, the board of management needs not only facilitate a transition to a more lenient approach to external sources of innovation but also how relationships with suppliers should be formed and maintained. Company X must however be cautious with how much of the internal development they outsource since going too far could mean that the company's own knowledge becomes too diminished.

Moreover, Company X has some existing activities that can be improved. The supplier technology days and walk around workshops are perceived as something that Company X can benefit from in their current form, but can with convenience be extended into also include new suppliers. Also, communicating the purpose of these activities is essential to avoid the lack of innovative ideas that was the case of the first supplier technology days in China. This extension of already existing activities would not only mean getting another opportunity to learn of new technologies but also mean an arena where Company X can get in contact with new suppliers. In addition, innovation contests are argued to be a method that can be used for suppliers as well as individuals from the crowd and become an additional method to Company X's toolbox.

Finally, Company X's evaluation process is in need of revision. To avoid ideas being neglected or forwarded without proper evaluation, the cross-functional evaluation that is currently placed further down the process should be moved upwards and instead be the first stage that an idea passes. A new team of innovation agents should act as evaluators at the early stages and together determine the feasibility of an idea. Thus, each department that is needed to accurately evaluate an idea will have a say before an idea is killed off or forwarded for further evaluation and possible NPD initiation at the PPMs. Important here is that the innovation agents have clear and set responsibilities and have time from their day-to-day work to put aside for the new task.

How can Company X improve their methods for using external sources of innovation?
Although suppliers are a very valuable innovation partner Company X should also consider looking elsewhere for external sources of innovation. Customers are already an integral part of the innovation activities but other sources such as universities, engineering companies, and individuals from the crowd are yet to be utilized. Collaboration with universities and engineering companies have already been highlighted as potential sources by Company X themselves and is something that they should look further into, but using the crowd through crowdsourcing is still a new phenomenon to Company X. The most forward way of using crowdsourcing, and the way that is considered to best suit Company X, is to use innovation contests, which accounts for the many differences between Company X's component categories. Moreover, Company X could benefit from the use of crowd labor markets to relieve the R&D department of some of the more repetitive and trivial tasks that have been causing frustration, and thus free time and resources to work on more value-adding activities such as advanced engineering.

8 Implications for future research

Extending the internal R&D capabilities through the use of external sources of innovation has empirically been shown to improve the effectiveness of a company's R&D. There does however exist a grey area concerning how much a company should outsource and how much should be kept in-house and the ratio seems to be unique to every company. It would therefore be interesting and most needed, to further analyze what this ratio depends on and how companies, such as Company X, can find the optimal balance. In addition, the potential issues of IP rights when employing external sources of innovation, and the role of intermediaries in this area is also of interest for future research. Furthermore, what has been touched on but not thoroughly discussed is the use of separate "innovation groups" with the sole purpose of working with innovation. The implications of this for Company X could be potentially detaching a part of the R&D teams to solely work on advanced engineering, while other employees handle the more day-to-day operations. Therefore, further analysis of how these groups should be formed and governed are of interest both for the subject of innovation itself but also for Company X moving forward.

Moreover, the correlation between increased use of suppliers as a source of innovation and the closer form of relationship this requires deserves more attention as it is considered to have great impact on successfully leveraging external innovation. Company X should investigate how their enhanced supplier relationship strategy can facilitate incorporating more supplier innovation, which could serve as a benchmark for other companies and industries. Finally, the role of the sourcing department becomes particularly interesting when discussing supplier innovation, which is why an alternate way of measuring success other than that of cost reductions, and encourages them to look for and value the best innovations rather than simply cost, is desired for further research.

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10 Appendix

In this chapter a collection of the supporting documents for the thesis is presented.

10.1 Interview templates

This appendix chapter presents the interview templates used for the semi-structured interviews. The questions where however complemented by additional follow-up or clarification questions not presented here. The interviews all start with an introduction and ends in the same way. The question do change for every interview, which is why they are all displayed for each respective interviewee.

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Introduction (same for all)

Thank the person for taking time to do this interview
Thank you so much for taking your time to do this interview with us! We really appreciate it!

Introduce ourselves and explain why we are making this interview
We are making this interview as a part of our Master thesis at Chalmers but also to gain insight and learn for the future regarding innovation at large companies.

Ask if it is ok to record the interview
State that the recordings will only be used by us and not forwarded

Set expectations for the time frame of the interview
(If the pilot shows that the interview takes 30 minutes say that it takes 50-60 minutes)

Make it clear that they are in control over the interview
If there is any question that you do not feel comfortable asking then just say and we will proceed to the next question

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Questions - Sourcing Manager FLT

<u>Background</u>

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? What kind of activity was it? How do you think this collaboration is working out?
- How much do you collaborate between different geographical units?

<u>Innovation</u>

- In which way are you and/or your department involved in innovation at Company X?
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments?

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- What are the incentives for suppliers working with Company X?
- Why do you think that you are working with these specific suppliers?
- How do you think supplier relationships and innovation affects each other, both short and long term?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

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Questions - VP R&D Mobile equipment

Background

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? What kind of activity was it?
- How do you think this collaboration is working out?
- Which other department at Company X do you collaborate with the most?
- How much do you collaborate between different geographical units?

Innovation

- In which way are you and/or your department involved in innovation at Company X ? (very broad question)
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments?

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- Why do you think that you are working with these specific suppliers?
- How do you think supplier relationships and innovation affects each other, both short and long term?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Head of R&D FLT

Background

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? What kind of activity was it? How do you think this collaboration is working out?
- Which other department at Company X do you collaborate with the most?
- How much do you collaborate between different geographical units?

Innovation

- In which way are you and/or your department involved in innovation at Company X ? (very broad question)
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments
- Where do new ideas usually come from? Market, sales or internally from R&D?
- How do you evaluate new innovative ideas at your department?

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- Why do you think that you are working with these specific suppliers?
- How do you think supplier relationships and innovation affects each other, both short and long term?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?
- Do you feel that you have the right competences in-house or do you have to use suppliers to solve certain problems?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Project Manager Coming Generation / Head of R&D CCH

Background

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? What kind of activity was it? How do you think this collaboration is working out?
- Which other department at Company X do you collaborate with the most?
- How much do you collaborate between different geographical units?

Innovation

- In which way are you and/or your department involved in innovation at Company X ? (very broad question)
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- Why do you think that you are working with these specific suppliers?
- Please describe a time when you evaluated an idea (at CCH) and how it was processed.
- How do you think supplier relationships and innovation affects each other, both short and long term?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Sourcing Manager MAU 1

Background

- Could you please state your role and what your current responsibilities are?

Innovation

- In which way are you working with innovation? (very broad question)
- How do you work with supplier innovation?
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you done or you yourself participated in?
- Could you describe a supplier that you would consider a good innovation partner?

- How do you evaluate supplier ideas?
- Please describe a situation where a supplier came with an innovation that ended up in one of your products?

Supplier technology days

- Please briefly describe the supplier technology days
- How did you select the supplier that are going to be present during the supplier technology days? Existing, new?
- What are your expectations from the supplier technology days?

Other

- If you were to describe the optimal way of working with supplier innovation, what would that be?
- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……..

Questions - Global Head of Sourcing TT

Background

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? W hat kind of activity was it?
- How do you think this collaboration is working out?
- Which other department at Company X do you collaborate with the most?
- How much do you collaborate between different geographical units?

Innovation

- In which way are you and/or your department involved in innovation at Company X? (very broad question)
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- Why do you think that you are working with these specific suppliers?
- How do you think supplier relationships and innovation affects each other, both short and long term?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……..

Questions - Category Manager 1

Background

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? What kind of activity was it? How do you think this collaboration is working out?

Innovation

- In which way are you and/or your department involved in innovation at Company X ? (very broad question)
- How do you think that your department's way of working with innovation is functioning compared to previous experience?
- Which (if any) innovation activities have you participated in that involves other departments'

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- Why do you think that you are working with these specific suppliers?
- How do you think supplier relationships and innovation affects each other, both short and long term?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Supplier technology days

- Please describe this. Why these suppliers? What is the expectations?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Head of FLT

Background

- Could you please state your role and what your current responsibilities are?
- How much do you collaborate between different geographical units?

Innovation

- In which way are you working with innovation at FLT? (very broad question)
- How do you think that FLT's way of working with innovation is functioning?
- Which (if any) innovation activities have FLT done or you yourself participated in?
- Can you describe the purpose of the innovation centre.
- Can you please describe a typical PPM meeting
- What do you know about the coming generation project?

Supplier Innovation

- How involved are you in the supplier technology days and what are your expectations for those days?
- Could you describe a supplier that you would consider a good innovation partner.
- Please describe a case where supplier driven innovation ended up in one of the products. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Innovation Management

- Which discipline should be responsible for handling the contact with supplier when it comes to communicating their new ideas/capabilities?
- Which discipline should be responsible for handling the contact with supplier when Company X wants to solve a problem using suppliers?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Sourcing Manager MAU 2

Background

- Could you please state your role and what your current responsibilities are?
- How much of your department's work is conducted in collaboration with other departments within Company X? What kind of activity was it? How do you think this collaboration is working out?
- How much of your everyday work is conducted together with other departments. How is it working out?
- Which other department at Company X do you collaborate with the most?
- How much do you collaborate between different geographical units?

Innovation

- In which way are you and/or your department involved in innovation at Company X ? (very broad question)
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments
- Where do new ideas usually come from? Market, sales or internally from R&D?

- How do you evaluate new innovative ideas at your department?

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- If you were to estimate how often do suppliers reach out to you with ideas for innovation? In which form do these ideas often come (Mail, phone etc)? How often do these ideas reach the next step in the process?
- Why do you think that you are working with these specific suppliers?
- How do you think supplier relationships and innovation affects each other, both short and long term?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Category Manager 2

Background

- Could you please state your role and what your current responsibilities are?
- Could you please tell us a little bit about the categories you are responsible for
- How much do you collaborate with other departments?

Supplier innovation

- In which way are you working with innovation? (very broad question)
- How do you work with supplier innovation?
- How do you think that your department's way of working with innovation is functioning?
- Could you describe a supplier that you would consider a good innovation partner?
- How do you evaluate supplier ideas?
- Please describe a situation where a supplier came with an innovation that ended up in one of your products?

Supplier technology days

- Are you planning to have a supplier technology day for your category? Why/why not?

Other

- If you were to describe the optimal way of working with supplier innovation, what would that be?
- Which department should drive innovation in the organization?
- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

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Questions - Head of R&D TT

Background

- Could you please state your role and what your current responsibilities are?
- How do you work with innovation at Company X ? (very broad question)
- How do you think that your department's way of working with innovation is functioning?
- Which (if any) innovation activities have you participated in that involves other departments
- Where do new ideas usually come from? Market, sales or internally from R&D?
- How do you evaluate new innovative ideas at your department?

Supplier Innovation

- Is your department involved in any activities regarding supplier innovation? If so, in what way? How do you think this is functioning?
- Are you making too much development in house today?
- What qualities would you consider particularly important of a supplier?
- How do you find new suppliers?
- Please describe a case where you received an idea from outside of your department. How did this idea get to you? How was it processed at your department?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

……

Questions - Head of Sales CCH

Background

- Could you please state your role and what your current responsibilities are?
- How much do you collaborate between different BL's?

Innovation

- In which way are you working with innovation at CCH? (very broad question).
- How did you evaluate new ideas for CCH BL?
- Which, if any, activities have you participated in with the purpose of leveraging supplier innovation capabilities?
- Are you involved in the supplier technology days and what are your expectations for those days?
- Could you describe a supplier that you would consider a good innovation partner.
- Why do suppliers want to work with Company X? What must Company X do to attract new suppliers?
- If you were to describe the optimal way of working with supplier innovation, what would that be?

Innovation Management

- Which discipline should be responsible for handling the contact with supplier when it comes to communicating their new ideas/capabilities?
- Which discipline should be responsible for handling the contact with supplier when Company X wants to solve a problem using suppliers

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

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Questions - Supplier 1

Background

- Could you please describe Supplier 1 Company and what you do?
- How long have you been working with Company X?
- How did the relationship start? Who contacted who?

Innovation

- How do you work with innovation at Supplier 1 Company?
- Do you consider yourself an innovative company? Why?

Innovation at Company X

- How are you involved in innovation activities at Company X?
- Would you say that the collaboration is functioning well?
- What works well and what do you want to change?
- Do you work differently with other customers?

Company X as a customer

- Would you consider Company X a good customer. If so, what makes them a good customer?
- Would you like to have a closer relationship with Company X? why/why not?
- What do you think could get better with the relationship between you and Company X?
- What would the optimal supplier-customer relationship be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

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Questions - Supplier 2

Background

- Could you please describe Supplier 2 Company and what you do?
- How long have you been working with Company X?

- How did the relationship start? Who contacted who?

Innovation

- How do you work with innovation at Supplier 2 Company?
- Do you consider yourself an innovative company? Why?

Innovation at Company X

- How are you involved in innovation activities at Company X?
- Would you say that the collaboration is functioning well?
- What works well and what do you want to change?
- Do you work differently with other customers?

Company X as a customer

- Would you consider Company X a good customer (beyond that they buy stuff? If so, what makes them a good customer?
- Would you like to have a closer relationship with Company X? why/why not?
- What do you think could get better with the relationship between you and Company X?
- What do you think will be the next step in your relationship with Company X?
- What would the optimal supplier-customer relationship be?

Other

- Is there anything that you would like to bring up that we haven't discussed today or someone that you think that we should talk to regarding this topic?

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End in time (or if there are questions left when time is due ask if it is time to continue)

- Thank for the interview
- Thanks for taking your time and if there is anything that you would like to add or ask do not hesitate to contact us. Here is our contact information. (Ask if it is ok if we contact them if we come across any further questions.)

10.2 Documentation of statements

In this subchapter the statements from the interviews are presented. They are reflected as true to reality as possible. When a translation has been made from Swedish to English both the thesis writers have been reviewing the translation in order to make sure that they the translation match the actual saying.

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Sourcing Manager FLT

1. Collaborations with departments take place on a daily basis
2. Collaboration between departments is something that has been implemented quite recent
3. Some problems with the responsibility of the sourcing relationship managers
4. The business line sourcing managers meets on a regular basis (once a week)

5. The sourcing department is involved in the technology days
6. Technology days means that suppliers are invited to share the latest innovations
7. The sourcing department also work with enhances SRM, this is the closest form of relationship (3 suppliers atm)
8. The sourcing department is transforming due to closing of the Swedish factory
9. The sourcing team will move to new innovation and technology center
10. The sourcing team will focus more on innovation than actual buying
11. The interviewee suggests being more active and less passive in terms of innovation
12. The need for innovation usually comes from the market side (customers, the market itself or new regulations)
13. Customer innovation demand identified by sales -> R&D takes responsibility -> Sourcing located manufactures -> Sales sell
14. New ideas can also come from R&D or any other department
15. Relationships with suppliers are important in order to capture new innovation
16. In order to shorten the lead time it is important to have a clear contact point for suppliers when they have an idea they want to share
17. The company cannot have the same relationships will all suppliers
18. Important to choose which suppliers to work with when it comes to innovation
19. Evaluating suppliers based on R&D spend/turnover and technical expertise to determine which suppliers to work with
20. It is much more convenient to choose Swedish suppliers because they are close
21. Technology day in China and no one won the most innovative supplier award
22. Company X is basing their selection of suppliers on cost mostly
23. Incentive for supplies according to interviewee: Communicating the value of working with Company X when meeting with suppliers
24. The optimal way of working with supplier innovation is to always know what customer demand is and will be
25. Information about customer demand should then be shared and managed by both R&D and sourcing to find the best suppliers

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VP R&D Mobile equipment

1. There is too much short term focus within R&D
2. Shift to long term focus for R&D is needed
3. A lot of R&D works is coordinated together with sourcing
4. R&D and sourcing are deeply intertwined
5. Collaboration between different departments are good
6. Problem with the broad location of departments
7. R&D centralized within each business line - CCH, FLT & TT have heavy internal business line focus
8. R&D Centralized within each sister company - MEQ, Automation & Cranes have heavy internal focus
9. Losing synergies because of centralized business lines and sister companies
10. Sourcing is a lot better to use possible synergies, they work with a coordinator
11. Lack innovation management process due to heavy business line orientation
12. The lack of innovation management is a result of the splitting of Company X into three separate business lines. Innovation management got lost in the process.
13. Problem with handling future demand since there is no plan for that

14. People within the organization have a lot of good ideas but no time and event to share them
15. Started to work more with this already (workshop)
16. Regular meetings with suppliers (which the VP attend)
17. Meetings are often initiated by sourcing but several departments attend
18. Hard for supplier to reach out to Company X for discussing long term plans
19. Innovation fund exist but it is not used (2,5% of 15%)
20. Some ideas from suppliers are evaluated
21. Big value in increasing supplier relationships
22. Wishes to have fewer suppliers with closer relationships
23. However the dual sourcing strategy could be in the way of close relationships with one supplier
24. Incentives for suppliers: small in comparison with automotive industry
25. Image value when working with Company X for suppliers (premium market leader)
26. Company X want to lead innovation which makes suppliers eager to work with them
27. Going from component to system level
28. Internal R&D department should be minimized

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Head of R&D FLT

1. The R&D department is project owners in development projects
2. The R&D department collaborates with many other departments in their work, but which departments differs between project types
3. Usually a request comes from the market department, but can also come from within the R&D department or other departments or suppliers
4. Within the R&D department there is a division called "Advanced Engineering" that should focus on new innovations
5. Historically, the R&D department's resources was divided as: 32 % product maintenance, 22 % on cust.cust, 41 % NPD, 5 % AE
6. New product ideas are evaluated at a PPM meeting held each month (product portfolio meeting)
7. In the PPM meetings ideas are presented and discussed with all departments in the product line
8. Before an idea reaches the PPM meeting, it is evaluated at the R&D department in so called "missions"
9. The missions are carried out by the R&D department but could involve other departments as well
10. The goal of the missions are to evaluate if an idea is worth to bring to the PPM
11. The R&D department participates in meetings with suppliers, workshops and is going to be involved in the new "supplier technology days"
    In these supplier meetings, it is usually existing supplier but could be new as well
12. When selecting supplier there is sometimes a gap between Sourcing and R&D
13. Sourcing has had big focus on cost, and want to switch suppliers while R&D sees other gains keep working with the same supplier
14. The interviewee thinks that Company X's strong brand is a motivation for suppliers to work with them
15. The interviewee's business line is different from other product lines because of the high proportion of customer customization

16. Customer customization requires fast and flexible R&D processes
17. Company X has a lot of good internal competence, but sometimes requires outside help to solve a problem
18. They evaluate potential suppliers by their technical expertise and convenience
19. They research potential suppliers by asking several different suppliers for their solutions
20. Learning of many different suppliers' solution gives Company X good knowledge in the area
21. The optimal way of working with supplier innovation is to work closer with suppliers
22. More resources put on NPD, advanced engineering and innovation in general is desired

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Project Manager Coming Generation / Head of R&D CCH

1. Initiation of project done by R&D because they had bad long term roadmaps
2. Project involves all departments from all of MEQ
3. At CCH collaboration was mostly done with sourcing and production but also sales and marketing
4. Within business line good collaboration (FLT)
5. Between business lines lacking collaboration (FLT-CCH)
6. Today ad hoc solutions for innovation new project aim for making innovation process more structured
7. At CCH they did not work systematically with innovation there was simply not enough time
   15% budget for advanced engineering has never been reached
   Interviewee says that this lack of time for advances engineering is shared amongst all business lines
8. Technology supplier day initiative is good
9. Suppliers are brought in the beginning of an NPD project to get their input but it is mostly about developing existing products
10. Generally it is Company X that are reaching out to suppliers when they need to solve a particular problem
11. When the suppliers do make contact it is rarely processed because they do not have time
12. When an idea enters it is evaluated by the internal R&D team but collaboration with the department person entity that brought in the idea
13. Differences in evaluation process in minor/major innovations (if minor the above is true)
14. If it is a major innovation then a concept development project is initiated involving all other departments
15. The R&D department is the owner of these projects
16. Supplier relationship is important, therefore it is important they want to see a win-win relationship
17. Suppliers must be innovative and have the right knowledge
18. When choosing which suppliers to work with there are four steps (1. 2. The supplier can provide the right quality 3. Mutual trust 4. Price (some importance)
19. The optimal way to work would be to continuously scan what is relevant now as well as what would be relevant in the future regarding technology

20. Product Managers have many ideas and are good at seeing possibilities

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Sourcing Manager MAU

1. Collaboration are done continuously with other departments as well as other MAU's
2. A majority of the time it works well but different groups have different priorities which creates challenges
3. Sourcing is involved in innovation in early stages of NPD
4. Sourcing is responsible for talking to suppliers and then bringing R&D in to evaluate which suppliers to work with
5. From a sourcing point of view it is important to see what the suppliers have and what they can do
6. Mostly focus on today's strategic partners
7. They are lagging behind in certain technology areas (ex electric engines)
8. Technology days are important in setting a direction for the future
9. They must decide with whom they want to partner in the future
10. Products are very different in terms of technology and costs (compare terminal tractors and CCH)
11. Suppliers are brought in depending on what they can offer and what key initiatives they are working on
    60% of ideas comes from external sources and 30% comes from internal sources (10% we don't know)
12. When evaluating an idea it mostly comes down to customers willingness to pay
13. Determining customers willingness to pay is done through bringing up the idea and asking if they are willing to pay for it
14. Danger in that because different customers have different standards (example 6-cylinder to 4-cylinder engine)
15. Sourcing, R&D and existing suppliers are typically united when ideas evolve
16. New suppliers probably do not know who to contact
17. Exposes' is used as a way of meeting new supplier
18. An example when an expo resulted in a new supplier was the one with BOSE
19. Suppliers usually have deeper pockets to fund development
20. Suppliers are often technology leader in their respective segment
21. Supplier relationships are critical to innovation
22. If Company X and the supplier do not have a close collaboration the supplier will not share their ideas
23. The optimal way of working with innovation is that supplier bring in ideas to Company X and that these ideas are captured

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Global Head of Sourcing TT

1. R&D is probably the heaviest interface
2. Everyone must buy into the concept before you introduce something new
3. Test new things and be adaptive when working with innovation
4. Innovation that is not asked for from customers are harder to identify

5. Management trying to impose new and innovative ideas may sometimes take decisions that is not aligned with market demand
6. Innovation has to happen continuously and should not be treated as a project or a program
7. Walk around example where suppliers see the product and get to suggest improvements can be a good source of innovation
8. Laying the groundwork and building relationships with suppliers are important for future innovation
9. Understanding of how innovation can be applied is important, sometimes the obvious application isn't the best
10. Coordinate work with sales and sourcing
11. Financial footing is important when choosing a supplier
12. You have to know the supplier in order to know if it is innovative or not
13. Innovative companies are not the biggest nor is it always existing suppliers
14. Suppliers will also look for innovative companies willing to test their ideas
15. Company X aims to be such a company
16. Ideas often comes from outside the company and they are often implemented
17. Ideas are often introduced with a cost argument

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Category Manager

1. A lot of contact with engineering from sourcing
2. A lot of cross functional work
3. Sometimes Company X drives innovation with the supplier when asking for lower costs through "envelope" procurement
4. Sometimes innovation is driven by regulation
5. It depends on the category that the supplier is within that determines how much innovation push comes from Company X
6. Company X has regular strategy meetings with some existing suppliers
7. Partnership relation that has to be profitable and that goals are shared (price, quality and innovation)
8. No one wins on squeezing profit margins from suppliers
9. Work with functional specifications instead of technical is a better way
10. There are some resistance within the organization to work with functional specifications
11. Working with functional specifications takes more effort and time in the beginning at least
12. The automotive industry are working with functional specifications
13. Too much internal R&D
14. Sourcing do not know how to talk to the supplier without a technical specification
15. Internal R&D thinks that they know best
16. Brand recognition to use some suppliers (e.g. Volvo)
17. Conventions to learn about new techniques
18. Some categories are much more technical making it a lot harder to change suppliers
19. Commodity goods such as steel makes it a lot easier to change suppliers
20. Innovation has to create customer value in order to be profitable

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Head of FLT

1. Within business line good cooperation and between business line ok cooperation
2. Too little work with innovation within the business line (FLT)
3. Strategy work is planned y 3-4 years in the future
4. No specific group of group of people working solely with innovation exist
5. Desired innovation group reporting to head of R&D
6. This innovation group should be disconnected from a business line interface
7. Fuel cells is a technique which have been developed together with suppliers
8. It is more important to understand the customer's process rather than supplying them with products
9. The innovation centre in Ljungby are where the prototypes will be built
10. This innovation centre will host workshops, testing and other activities for customers and suppliers CCH, FLT will be based here, TT will have their innovation centre in Ottawa
11. The PPM meeting is owned by the product manager The PPM meeting is held once a month
12. The PPM meeting is cross functional
13. The PPM meeting covers which products should be kept and which one that Company X should discard
14. The portfolio of products of mobile equipment should have a certain DNA specific for Company X
15. During the supplier technology days there should be mutual learning between the supplier and Company X. The supplier should learn from Company X and Company X should learn from the supplier
    It is important to be open relationship towards the supplier and showing that you are willing to be innovative
16. A good supplier is a supplier that is curious on how Company X works and also delivers on the requirements made by Company X
17. The supplier should also suggest improvement, have a forward thinking strategy
18. Suppliers cost should be held down but not by price wars but by other mechanisms
19. Sourcing is the best department to work with suppliers
20. In the future work more with system integration rather than designing specific parts (anyone can do that)
21. When the technique freaks got to choose the supplier the costs increased because the choice unnecessarily expensive products
22. Nowadays they work with core teams (cross functional) that determine the suppliers
23. Category responsible also have a saying in choosing the suppliers
24. Innovation and future does not have to be owned by R&D it could be owned by sourcing for example
25. The optimal way of working with suppliers is that suppliers make everything and that Company X only offers services

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Sourcing Manager MAU

1. Cooperation is generally good
2. Workshops is held with suppliers to co-develop
3. Usually workshops occur in NPD projects (3-4 years long), this is not optimal

4. Workshops should be held more often
5. Company X is missing a platform for pooling innovative ideas
6. At a conference, the interviewee noticed Nokia had a great platform for innovation sharing
7. Sourcing should be separated into operational and strategic sourcing
8. Strategic sourcing should have an innovation focus
9. R&D should also be separated to have a separate "innovation" division
10. There is an innovation fund at Company X that can be used
11. Sourcing is too product-oriented. Should be more focused on collaboration between business lines
12. The sourcing department must be more innovation focused
13. The sourcing department would need more technical skills to handle innovation
14. Sourcing should drive innovation
15. R&D should evaluate technical specifications of an idea
16. Sales should provide what customers want
17. Ideas are usually passed from sourcing to R&D for evaluation
18. Cost is usually the main driver for new ideas
19. The more complex categories (PT, Hydraulics) gets less "ad hoc" ideas from suppliers
20. Light steel is the most simple category
21. The most important thing is not to find new ideas, it is to IMPLEMENT new ideas
22. The interviewee would like to have a platform (like Nokia) that combines all departments
23. The screening part of ideas is important to find the most viable ideas
24. Company X needs to be open for adapting and adopting ideas
25. Company X needs to have confidence in suppliers ability to come up with good innovations
26. The maturity of the organization, R&D spend, long-term think and finances are important qualities of a supplier

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Category Manager

1. The supplier's knows the production best, what materials to use etc
2. Suppliers used as early as possible in NPD projects
3. More supplier involvement is needed, the more we ask the better
4. The steel category is different from PT and Hydraulics (System Categories)
5. Forging & Casting Category is similar to Steel
6. There's a lot of collaboration between category managers and R&D
7. Supplier involvement through workshops in NPD projects
8. Internal R&D and supplier R&D should have more contact
9. Today there's tight collaboration with key suppliers
10. Today, they have no structured way of finding new suppliers / technologies
11. Company X thinks too little about innovation, too much operational focus
12. Company X’s wants to produce and suppliers want more orders, less focus on innovation
13. Suppliers should have stable finances, drive innovation, quality and cost
14. Suppliers should WANT to work with Company X, their capabilities should match Company X's needs
15. Long-term relationships with suppliers is what works

16. An idea must be must be sufficiently communicated by the supplier to be processed by Company X
17. Ideas are forwarded from sourcing to R&D for initial evaluation
18. Most new ideas are cost-driven
19. Sales input are not so important in the steel category
20. The steel category has no current plans for a supplier technology day - Have not found the right suppliers
21. 3D manufacturing is a hot topic in the steel category
22. Everyone in the organization must be on board to work with innovation
23. An "idea bank" is wanted. A place where suppliers' knowledge can be stored and easily accessed

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Head of R&D TT

1. Collaboration with many different departments
2. There are not a lot of innovation activities within TT
3. There is no separate group dedicated to Innovation activities
4. Their tight budget dictates what they can and cannot do
5. A lot of time is spent on maintenance, and improving existing products according to customer specs
6. The coming generation project is the only innovation activity that they have had for a long time
7. Lack of resources is a problem, they should utilize universities and engineering companies
8. When evaluating a new idea they first ask the question "does it fit with our strategy?"
9. An idea is evaluated on the basis of how it can be aligned with future technology
10. Sometimes customers want a niche feature that has no viability in big volumes
11. The one who brings the idea is active in the evaluation of the idea in collaboration with R&D and sourcing
12. Sourcing and R&D evaluates the ideas most often. Sometimes other departments as well
13. Sometimes Company X develops the parts and sometimes the supplier does it
14. It is wanted that Company X does more integration and suppliers the development
15. Too much time is spent on product maintenance, Company X owns this process and not the supplier
16. Quality, delivery and reputation is important qualities of a supplier
17. It is important to understand on what basis a new supplier is evaluated
18. Googling, attending expos are ways to find new suppliers
19. A supplier must be a partner for the relationship to be successful
20. The problem of Company X and different suppliers using different CAD systems is brought up
21. A system that can translate between different systems is needed
22. A lot of time is lost when files are transferred and translated

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Head of Sales CCH

1. Some Categories have more collaboration than others between BLs
2. The complex categories often collaborate more between BLs
3. The coming generation project is an example of cross-BL collaboration
4. Some suppliers are eager to share innovations, some are not
5. It is important to integrate internal R&D with supplier R&D
6. It is hard for sourcing personnel to present new tech in front of R&D, R&D "knows best"
7. Cross-Functional teams is good to have to handle innovation
8. Sourcing should be a facilitator rather than a driver of innovation
9. Many good ideas comes from customers. Many customers are capable
10. Evaluating minor customer idea: From sales - engineering (price it) - back to customers
11. Evaluating major customer ideas: To PM, Business case, PPM meeting, NPD
12. Supplier often come with ideas, but usually not viable ideas
13. Much of the evaluation of ideas was based on the head of sourcing judgment
14. If the ideas was "ok" from sourcing they took it to PPM meeting
15. Important to see if the idea from the suppliers were something that customers would pay for
16. In 2012 CCH started to focus more on innovation
17. Quarterly meetings with existing suppliers to learn of new technologies
18. Supplier technology days with existing suppliers
19. Officially it is the category managers responsibility to find new suppliers
20. Some category managers are more lazy than others when it comes to finding new suppliers
21. 75% of new suppliers came themselves to Company X
22. The supplier's Brand Name is important when choosing supplier depending on the component
23. Internal battle of what suppliers to use
24. The most important qualities of a supplier is: brand, flexibility, knowledge, affectivity, quality
25. Suppliers want to work with Company X because they are innovative, market leader
26. Internal R&D must be integrated more closely with supplier R&D in the future
27. Innovation is not only the product but also the business model

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Supplier 1 (KAM Company X)

1. Supplies components for two different Company X categories, steel and cabins
2. The supplier bought Company X's own cabin manufacturing unit and started selling to them
3. Company X outsourced the welding of components, Supplier 1 took that business as well
4. In the Cabin category - A lot of innovation. Co-development between supplier and Company X
5. In the Steel category - No innovation. Supplier 1 builds according to drawings
6. Supplier 1 considers themselves innovative in the cabins category
7. Supplier 1 are not innovative in the steel category, but knows Company X's products better
8. For Cabins, Supplier 1 has their own innovation centre
9. They want to start an innovation centre for steel as well

10. Supplier 1 wants to take over, and are expecting to, more design job from customers
11. Designing "non-core" components will most likely be moved from customer to supplier
12. Supplier 1 and Company X engages in workshops at least once a year to discuss design changes
13. Company X is perceived as a good customer but with some flaws
14. The commitment from Company X is generally perceived as low, they are interested but rarely fully commit to something
15. Projects are cancelled too late which is frustrating for Supplier 1
16. Supplier 1 things that Company X is too afraid to try new things
17. Supplier 1 would like to see that Company X spends more funds on "outside of the box" activities lack of commitment is the biggest issue in the relationship between Company X and Supplier 1
18. Company X's R&D and sourcing are not always on the same page. R&D thinks they know best
19. Supplier 1 thinks that openness, collaboration and commitment from both sides is important in the relationship
20. Supplier 1 wants to bring innovation but the pricing discussion takes too much room
21. The TYSON-project (Cabins) is a good example of how the relationship should look
22. Supplier 1 was not invited to propose a design for the EC Frame - With no official explanation
23. Not even being invited hurt the relationship a lot
24. Supplier 1 needs to know WHAT Company X wants for the future
25. Supplier 1 are willing to invest in engineering capabilities if Company X commits

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Supplier 2 (KAM Company X)

1. Supplier for Company X since 2009
2. Supplies hydraulics for all of Company X
3. Supplier 2 was contacted by Company X because they needed higher quality
4. Supplier 2 was/is known for having worked with the automotive industry
5. Supplier 2 started their own production facilities in connection to Company X Manufacturing
6. Supplier 2 Is a leading company within hydraulics
7. Have their own development department to stay ahead in technology advancements
8. Supplier 2 sometimes does the drawing or part of the drawing for Company X
9. Sometimes Supplier 2 just manufactures according to drawing from Company X
10. Supplier 2 could also act as a sounding board
11. Supplier 2 would like to be involved earlier in the NPD process
12. Supplier 2 would like to spend more time with Company X on development matters
13. From the beginning the focus was quality and delivery, nowadays more cost focus
14. Cost focus is common among Supplier 2s customers
15. Looking at an excel and just comparing prices does not give the whole picture - Problem
16. Supplier 2 lost business for Company X China because of too much cost focus
17. The automotive industry has longer development times so Supplier 2 is around longer
18. Company X is considered a very important customer

19. Supplier 2 wants Company X to guide them into doing the right things both long- and short term
20. A lot of variations in Company X's products gives Supplier 2 could knowledge in many areas
21. For unique components, Company X owns the IP. For standard components Supplier 2 owns it
22. Supplier 2 thinks that the relationship must get closer for Company X to handle the competition
23. Now they have an open cost-calculation so both parties knows what cost what
24. The open cost-calculation lets Company X see what changes will do to the cost
25. Sourcing is handling all contact with Supplier 2
26. Supplier 2 would like the relationship to be based on a higher level than today
27. Company X board of directors and Supplier 2 board of directors should together set common goals for the relationship
28. Common goals would help both companies strive for the same thing and avoid confusion
29. Supplier 2 would like to take on more of Company X's "drawing" but realize the need for Company X to keep some knowledge in-house

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Observations from technology supplier days

1. Does warranty risks hinder innovation for certain product lines (MEQ)?
2. Problems with sharing technology between MEQ, Automations and Cranes
3. Company X should put requirements on the manufacturer - they know better!
4. The customer knows more about the product than Company X does
5. All suppliers are not willing to share new technologies
6. Internal engineers should have some "free-time" each week to think of new technologies
7. Supplier technology days but with a limited numbers of suppliers
8. How should the business case for an innovation be determined
9. Look outside the company for "crazy" new ideas
10. Who should look outside for new ideas, R&D manager or all R&D employees
11. According to engineer Ideas are not missing, but time is
12. There is a list with new product ideas, but where to find the list is not known to everyone
13. Ideas from customers are put on a waiting list
14. Unclear responsibilities on product development process
15. Smaller tasks such as translating manuals are taking time from more important issues
16. R&D not allowed to do enough prototyping?
17. Normally focus on larger ideas with less focus on smaller ideas
18. Need for more outsourcing for development (use suppliers for that?)
19. There has to be a balance between big innovative ideas – small incremental ideas.
20. Few patents are filed within the company
21. Too much incremental design improvements are handled by the internal R&D department. They should instead focus on the "bigger things

10.3 1st- and 2nd-order analysis

In this subchapter the aggregation of the statements are presented. The coding are based on emerging patterns rather than using predefined words. The entire analysis were performed in Excel but here the statements are presented as regular texts and pictures to make it easier to read.

10.3.1 1st- order aggregation

(When mentioned in the same sentence supplier is of higher order than innovation)

Collaboration positive

- Collaborations with departments take place on a daily basis
- A lot of R&D works is coordinated together with sourcing
- R&D and sourcing are deeply intertwined
- Collaboration between different departments are good
- The business line sourcing managers meets on a regular basis (once a week)
- Sourcing is a lot better to use possible synergies, they work with a coordinator
- The R&D department collaborates with many other departments in their work, but which departments differs between project types
- Collaboration are done continuously with other departments as well as other MAU's
- R&D is probably the heaviest interface
- A lot of contact with engineering from sourcing
- A lot of cross functional work
- At CCH collaboration was mostly done with sourcing and production but also sales and marketing
- Within business line good collaboration (FLT)
- Within business line good cooperation and between business line ok cooperation
- Cooperation is good
- There's a lot of collaboration between category managers and R&D
- Collaboration with many different departments
- Some Categories have more collaboration than others between BLs
- The complex categories often collaborate more between BLs
- The coming generation project is an example of cross-BL collaboration

Collaboration negative

- Collaboration between departments is something that has been implemented quite recently
- Problem with the broad location of departments
- R&D Centralized within each business line - CCH, FLT & TT have heavy internal business line focus
- Some problems with the responsibility of the sourcing relationship managers
- Losing synergies because of centralized business lines and sister companies
- A majority of the time it works well but different groups have different priorities which creates challenges
- Between business lines lacking collaboration (FLT-CCH)

Technology days

- Sourcing department is involved in technology days
- Technology days means that suppliers are invited to share the latest innovations
- Technology day in China and no one won the most innovative supplier

- Technology days are important in setting a direction for the future
- Technology supplier day initiative is good
- During the supplier technology days there should be mutual learning between the supplier and Company X. The supplier should learn from Company X and Company X should learn from the supplier

Coming Generation Project

- Initiation of project done by R&D because they had bad long term roadmaps
- Project involves all departments from all of MAQ
- Today ad hoc solutions for innovation new project aim for making innovation process more structured

Innovation center

- The sourcing department is transforming due to closing of the Swedish factory
- Sourcing team will move to new innovation and technology center
- Sourcing team will move to new innovation and technology center
- The innovation centre are where the prototypes will be built (CCH & FLT)
- This innovation centre will host workshops, testing and other activities for customers and suppliers
- CCH, FLT will be based here, TT will have their innovation centre in Ottawa

Ideation

- The need for innovation usually comes from the market side (customers, the market itself or new regulations)
- Customer innovation demand identified by sales -> R&D took responsibility -> Sourcing located manufactures -> Sales
- New ideas can also come from R&D or any other department
- Usually a request comes from the market department, but can also come from within the R&D department or other departments or suppliers
- 60% of ideas comes from external sources and 30% comes from internal sources (10% we don't know)
- When evaluating an idea it mostly comes down to customers willingness to pay
- Determining customers willingness to pay is done through bringing up the idea and asking if they are willing to pay for it
- Sourcing, R&D and existing suppliers are typically united when ideas evolve
- Expose's is used as a way of meeting new suppliers
- An example when an expo resulted in a new supplier was the one with BOSE
- Innovation that is not asked for from customers are harder to identify
- Ideas often comes from outside the company and they are often implemented
- Sometimes Company X drives innovation with the supplier when asking for lower costs through "envelope" procurement
- Sometimes innovation is driven by regulation
- It depends on the category that the supplier is within that determines how much innovation push comes from Company X
- Cost is usually the main driver for new ideas
- Googling, attending expos are ways to find new suppliers

Current supplier management

- Regular meetings with suppliers (which the VP attends), meetings are often initiated by sourcing but several departments attend
- Hard for supplier to reach out to Company X for discussing long term plans
- Some ideas from suppliers are evaluated
- However the dual sourcing strategy could be in the way of close relationships with one supplier
- Incentives for suppliers: small in comparison with automotive industry
- Image value when working with Company X for suppliers (premium market leader)
- Innovation fund exist but it is not used
- The R&D department participates in meetings with suppliers, workshops and is going to be involved in the new "supplier technology days"
- In these supplier meetings, it is usually existing supplier but could be new as well
- When selecting supplier there is sometimes a gap between Sourcing and R&D
- The interviewee thinks that Company X's strong brand is a motivation for suppliers to work with them
- They evaluate potential suppliers by their technical expertise and convenience
- They research potential suppliers by asking several different suppliers for their solutions
- Learning of many different suppliers' solution gives Company X good knowledge in the area
- Mostly focus on today's strategic partners
- Suppliers are brought in depending on what they can offer and what key initiatives they are working on
- Laying the groundwork and building relationships with suppliers are important for future innovation
- Financial footing is important when choosing a supplier
- Company X has regular strategy meetings with some existing suppliers
- Sourcing do not know how to talk to the supplier without a technical specification
- Brand recognition to use some suppliers (e.g. Volvo)
- Conventions to learn about new techniques
- Some problems with the responsibility of the sourcing relationship managers
- Sourcing department also work with enhances SRM, this is the closest form of relationship (3 suppliers atm)
- Suppliers are brought in the beginning of an NPD project to get their input but it is mostly about developing existing products
- Generally it is Company X that are reaching out to suppliers when they need to solve a particular problem
- When the suppliers do make contact it is rarely processed because they do not have time
- Fuel cells is a technique which have been developed together with suppliers
- When the technique freaks got to choose the supplier the costs increased because the choice unnecessarily expensive products
- Nowadays they work with core teams (cross functional) that determine the suppliers
- Category responsible also have a saying in choosing the suppliers
- Workshops is held with suppliers to co-develop
- The maturity of the organization, R&D spend, long-term think and finances are important qualities of a supplier
- The supplier's knows the production best, what materials to use etc

- Suppliers used as early as possible in NPD projects
- Today there's tight collaboration with key suppliers
- Today, they have no structured way of finding new suppliers / technologies
- Quality, delivery and reputation is important qualities of a supplier
- Some suppliers are eager to share innovations, some are not
- It is important to integrate internal R&D with supplier R&D
- Officially it is the category managers responsibility to find new suppliers
- Some category managers are more lazy than others when it comes to finding new suppliers
- 75% of new suppliers came themselves to Company X
- The supplier's Brand Name is important when choosing supplier depending on the component
- Internal battle of what suppliers to use
- The most important qualities of a supplier is: brand, flexibility, knowledge, affectivity, quality
- Suppliers want to work with Company X because they are innovative, market leader

Desired supplier management

- Evaluating suppliers based on R&D spend/turnover and technical expertise to determine which suppliers to work with
- The company cannot have the same relationships will all suppliers
- Important to choose which suppliers to work with when it comes to innovation
- Relationships with suppliers are important in order to capture new innovation
- It is much more convenient to choose Swedish suppliers because they are close
- Company X is basing their selection of suppliers on cost mostly
- Incentive for supplies according to interviewee: Communicating the value of working with Company X when meeting with suppliers
- The optimal way of working with supplier innovation is to always know what customer demand is and will be
- Big value in increasing supplier relationships
- Wishes to have fewer suppliers with closer relationships
- Company X want to lead innovation which makes suppliers eager to work with them
- Going from component to system level
- The optimal way of working with supplier innovation is to work closer with suppliers
- Sourcing is responsible for talking to suppliers and then bringing R&D in to evaluate which suppliers to work with
- From a sourcing point of view it is important to see what the suppliers have and what they can do
- They must decide with whom they want to partner in the future
- Suppliers usually have deeper pockets to fund development
- Suppliers are often technology leader in their respective segment
- Supplier relationships are critical to innovation
- You have to know the supplier in order to know that it is innovative or not
- Partnership relation that has to be profitable and that goals are shared (price, quality and innovation)
- No one wins on squeezing profit margins from suppliers
- The automotive industry are working with functional specifications

- Information about customer demand should then be shared and managed by both R&D and sourcing to find the best suppliers
- Supplier relationship is important, therefore it is important they want to see a win-win relationship
- Suppliers must be innovative and have the right knowledge
- When choosing which suppliers to work with there are four steps (1. 2. The supplier can provide the right quality 3. Mutual trust 4. Price (some importance)
- It is important to be open relationship towards the supplier and showing that you are willing to be innovative
- A good supplier is a supplier that is curious on how Company X works and also delivers on the requirements made by Company X
- The supplier should also suggest improvement, have a forward thinking strategy
- Suppliers cost should be held down but not by price wars but by other mechanisms
- Sourcing is the best department to work with suppliers
- More supplier involvement is needed, the more we ask the better
- Internal R&D and supplier R&D should have more contact
- Suppliers should have stable finances, drive innovation, quality and cost
- Suppliers should WANT to work with Company X, their capabilities should match Company X's needs
- Long-term relationships with suppliers is what works
- A supplier must be a partner for the relationship to be successful
- Internal R&D must be integrated more closely with supplier R&D in the future

Current innovation management

- Lack innovation management process due to heavy business line orientation
- The lack of innovation management is a result of the splitting of Company X into three separate business lines. Innovation management got lost in the process.
- There is too much short term focus within R&D
- Problem with handling future demand since there is no plan for that
- People within the organization have a lot of good ideas but no time and event to share them
- The R&D department is project owners in development projects
- In the PPM meetings ideas are presented and discussed with all departments in the product line
- Before an idea reaches the PPM meeting, it is evaluated at the R&D department is so called "missions"
- The missions are carried out by the R&D department but could involve other departments as well
- The goal of the missions are to evaluate if an idea is worth to bring to the PPM
- New product ideas are evaluated at a PPM meeting held each month (product line meeting)
- Company X has a lot of good internal competence, but sometimes requires outside help to solve a problem
- Sourcing is involved in innovation in early stages of NPD
- New suppliers probably do not know who to contact
- If Company X and the supplier do not have a close collaboration the supplier will not share their ideas
- Everyone must buy into the concept before you introduce something new

- Management trying to impose new and innovative ideas may sometimes take decisions that is not aligned with market demand
- Walk around example where suppliers see the product and get to suggest improvements can be a good source of innovation
- Too much internal R&D
- Internal R&D thinks that they know best
- Brand recognition to use some suppliers (e.g. Volvo)
- Conventions to learn about new techniques
- Some categories are much more technical making it a lot harder to change suppliers
- Commodity goods such as steel makes it a lot easier to change suppliers
- At CCH they did not work systematically with innovation there was simply not enough time
- 15% budget for advanced engineering has never been reached
- Interviewee says that this lack of time for advances engineering is shared amongst all business lines
- Too little work with innovation within the business line (FLT)
- Strategy work is planned y 3-4 years in the future
- No specific group of group of people working solely with innovation exist
- Usually workshops occur in NPD projects (3-4 years long), this is not optimal
- Workshops should be held more often
- Company X is missing a platform for pooling innovative ideas
- Ideas are usually passed from sourcing to R&D for evaluation
- The more complex categories (PT, Hydraulics) gets less "ad hoc" ideas from suppliers
- Company X thinks to little about innovation, too much operational focus
- Company X's wants to produce and suppliers want more orders, less focus on innovation
- Ideas are forwarded from sourcing to R&D for initial evaluation
- The steel category has no current plans for a supplier technology day - Have not found the right suppliers
- There are not a lot of innovation activities within TT
- There is no separate group dedicated to Innovation activities for TT
- Their tight budget dictates what they can and cannot do
- A lot of time is spent on maintenance, and improving existing products according to customer specs
- The coming generation project is the only innovation activity that they have had for a long time (TT)
- Lack of resources is a problem, they should utilize universities and engineering companies
- Sometimes Company X develops the parts and sometimes the supplier does it
- Too much time is spent on product maintenance, Company X owns this process and not the supplier
- The problem of Company X and different suppliers using different CAD systems is brought up
- A lot of time is lost when files are transferred and translated
- It is hard for sourcing personnel to present new tech in front of R&D, R&D "knows best"
- Cross-Functional teams is good to have to handle innovation
- Sourcing should be a facilitator rather than a driver of innovation

- Many good ideas comes from customers. Many customers are capable
- In 2012 CCH started to focus more on innovation
- Quarterly meetings with existing suppliers to learn of new technologies
- Supplier technology days with existing suppliers

Desired innovation management

- In order to shorten the lead time it is important to have a clear contact point for suppliers when they have an idea they want to share
- Shift to long term focus for R&D is needed
- Internal R&D department should be minimized
- More resources put on NPD, advanced engineering and innovation in general is desired
- The optimal way of working with innovation is that supplier bring in ideas to Company X and that these ideas are captured
- Test new things and be adaptive when working with innovation
- Innovation has to happen continuously and should not be treated as a project or a program
- Understanding of how innovation can be applied is important, sometimes the obvious application isn't the best
- Coordinate work with sales and sourcing
- Innovative companies are not the biggest nor is it always existing suppliers
- Suppliers will also look for innovative companies willing to test their ideas
- Work with functional specifications instead of technical is a better way
- Innovation has to create customer value in order to be profitable
- The optimal way to work would be to continuously scan what is relevant now as well as what would be relevant in the future regarding technology
- Desired innovation group reporting to head of R&D
- This innovation group should be disconnected from a business line interface
- In the future work more with system integration rather than designing specific parts (anyone can do that)
- Innovation and future does not have to be owned by R&D it could be owned by sourcing for example
- The optimal way of working with suppliers is that suppliers make everything and that Company X only offers services
- Sourcing should be separated into operational and strategic sourcing
- Strategic sourcing should have an innovation focus
- R&D should also be separated to have a separate "innovation" division
- The sourcing department must be more innovation focused
- The sourcing department would need more technical skills to handle innovation
- Sourcing should drive innovation
- R&D should evaluate technical specifications of an idea
- Sales should provide what customers want
- The most important thing is not to find new ideas, it is to IMPLEMENT new ideas
- The interviewee would like to have a platform (like Nokia) that combines all departments
- The screening part of ideas is important to find the most viable ideas
- Company X needs to be open for adapting and adopting ideas

- Company X needs to have confidence in suppliers ability to come up with good innovations
- An idea must be must be sufficiently communicated by the supplier to be processed by Company X
- Everyone in the organization must be on board to work with innovation
- An "idea bank" is wanted. A place where suppliers' knowledge can be stored and easily accessed by all of Cargotec
- It is wanted that Company X does more integration and suppliers the development
- It is important to understand on what basis a new supplier is evaluated
- A system that can translate between different systems is needed for CAD

Department Specific Information

- The R&D department is responsible for 4 areas: NPD, Customer customization, product maintenance and new concepts
- Within the R&D department there is a division called "Advanced Engineering" that should focus on new innovations
- Historically, the R&D department's resources was divided as: 32 % product maintenance, 22 % on cust.cust, 41 % NPD, 5 % AE
- The interviewee's (FLT R&D) business line is different from other product lines because of the high proportion of customer customization
- Customer customization requires fast and flexible R&D processes
- They are lagging behind in certain technology areas (ex electric engines)
- Products are very different in terms of technology and costs (compare terminal tractors and CCH)
- There are some resistance within the organization to work with functional specifications
- Product Managers have many ideas and are good at seeing possibilities
- Sourcing is too product-oriented. Should be more focused on collaboration between business lines
- Light steel is the most simple category

Idea evaluation

- Determining customers willingness to pay is done through bringing up the idea and asking if they are willing to pay for it
- Danger in that because different customers have different standards (example 6-cylinder to 4-cylinder engine)
- Ideas are often introduced with a cost argument
- When an idea enters it is evaluated by the internal R&D team but collaboration with the department person entity that brought in the idea
- Differences in evaluation process in minor/major innovations (if minor the above is true)
- If it is a major innovation then a concept development project is initiated involving all other departments
- The R&D department is the owner of these projects
- The PPM meeting is owned by the product manager (The PPM meeting is held once a month)
- The PPM meeting is cross functional

- The PPM meeting covers which products should be kept and which one that Company X should discard
- The portfolio of products of mobile equipment should have a certain DNA specific for Company X
- Most new ideas are cost-driven
- When evaluating a new idea they first ask the question "does it fit with our strategy?"
- An idea is evaluated on the basis of how it can be aligned with future technology
- Sometimes customers want a niche feature that has no viability in big volumes
- The one who brings the idea is active in the evaluation of the idea in collaboration with R&D and sourcing
- Sourcing and R&D evaluates the ideas most often. Sometimes other departments as well
- Evaluating minor customer idea: From sales - engineering (price it) - back to customers
- Evaluating major customer ideas: To PM, Business case, PPM meeting, NPD
- Supplier often come with ideas, but usually not viable ideas
- Much of the evaluation of ideas was based on the head of sourcing judgment
- If the ideas was "ok" from sourcing they took it to PPM meeting
- Important to see if the idea from the suppliers were something that customers would pay for

Other

- It is more important to understand the customer's process rather than supplying them with products
- At a conference, the interviewee noticed Nokia had a great platform for innovation sharing
- There is an innovation fund at Company X that can be used
- The steel category is different from PT and Hydraulics (System Categories)
- Forging & Casting Category is similar to Steel
- Sales input are not so important in the steel category
- 3D manufacturing is a hot topic in the steel category
- Innovation is not only the product but also the business model

10.3.2 2nd - order analysis

Drawing on the problems mentioned in each subcategory the 2nd-order analysis were performed and conducted. Some problems were deemed to be of lesser importance and were therefore excluded from the analysis.

Supplier Relationship Management	
Current	Desired
Regular meetings are held with key suppliers	Being the "customer of choice" for suppliers
Hard for non-key suppliers to reach out to Kalmar	Important to choose the right suppliers to work together with innovation
Relationship building is considered important	Communicating the value of working with Kalmar, showing that they are innovative
Suppliers are evaluated on financial, technical and innovation capabilities	Closer relationships with fewer suppliers
Kalmar's strong brand is motivating suppliers to work with them	Getting to know the suppliers better to know if they are innovative or not
Cross-functional CORE teams together decide on new suppliers	Forming win-win relationships, not only pushing for lower costs
Close relationships with suppliers are considered important for innovation	Suppliers must be forward thinking and be interested in helping Kalmar. Not only get more orders
Cost is a big factor when choosing suppliers	Open relationships with suppliers, share costs, profits and goals with eachother

Supplier Innovation	
Current	Desired
Workshops are held with key-suppliers during NPD projects	Clearer contact point for suppliers that wants to present a new idea
Supplier Technology Days is a new initiative to hear of supplier innovations	Becoming more innovative to show suppliers that Kalmar is an innovative company
Exposees is used as a way of meeting new supplier and learn of new technology	Work with the leading suppliers in each field
It depends on the category that the supplier is within that determines how much innovation push comes from Kalmar	Be active rather than passive when looking for new innovative suppliers
It is hard for new suppliers to reach Kalmar with their ideas	Source more R&D to suppliers
Googling, reading industry magazines and using the Cargotec network is used to find new suppliers and technologies	Steel cateogry requires a structured way to find new innovative suppliers to work with
Steel category has no structured way of finding new suppliers / innovations	

Innovation Management / Evaluation of Ideas	
Current	Desired
Lack of innovation management within MEQ due to heavy business line focus	More long-term R&D innovation thinking
Too much focus on short-term R&D	Innovation efforts should be continiuous
Problem with handling future demand	Coordination with all departments and business lines to ensure success
New Ideas are presented at PPM meeting once a month where cross-functional teams discuss	Working with functional specifications instead of technical - Less internal R&D
Before the ideas reaches the PPM meetings, R&D has done "missions" for initial evaluation	R&D and Sourcing should have separate groups working only with innovation
Too much internal R&D, they think they know best	A platform for storing and sharing ideas is needed ("Idea bank")
Almost no time is put on "advanced engineering" innovation efforts. Too much day-to-day work	Sourcing should be the main driver of innovation, they know the suppliers
Lack of time is considered a big problem at the R&D department	Kalmar needs to have confidence in the suppliers ability to create great components
Ideas are usually passed from sourcing to the R&D department for evaluation	Cross-Functional teams should evaluate new ideas
New innovations are not always aligned with customer demand	More resources put on NPD, advanced engineering and innovation in general is desired
Workshops with suppliers are held to seldom	
The different categories are very different from eachother when it comes to complexity	
Cost is usually a big factor when evaluating new ideas	
Difference between minor (missions) and major innovations (concept development)	
Customers willingness to pay is important when evaluating new ideas	
There is an innovation fund at Kalmar that can be used	
A innovation centre is being built to foster innovation activities	

Ideation	
Current	Desired
Most ideas comes from customers through the sales organization	Suppliers should want to come with new ideas to Kalmar
Ideas could also come from suppliers & other internal departments	Structured through a platform
Sometimes driven by regulations (Emission levels)	An idea must be must be sufficiently communicated by the supplier to be processed by Kalmar
Innovation that is not asked for from customers are harder to identify	
Ideas often comes from outside the company and they are often implemented	
Cost is usually the main driver for new ideas	

10.3.3 Results

The results from the 2nd order analysis then led to the following action titles in the analysis:

Supplier relationship management > Cost focus over extended relationship
Supplier Innovation > New initiatives do not facilitate discovery of new suppliers. No strangers to open innovation but heritage shines through
Innovation Management / Evaluation of ideas > Unstructured evaluation process leaves room for avoidable mistakes,
Ideation > Unilateral focus risks shadowing potential sources of innovation