



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY

---

# **Key success factors in the Front End of Innovation**

A case study on a technology driven SME  
in the automotive industry

Master's Thesis in the Master's Programmes Quality and Operations Management and  
Management and Economics of Innovation

ERIK GALLON

ANTON PETERSSON



MASTER'S THESIS E 2019:025

# Key success factors in the Front End of Innovation

A case study in a technology driven SME in the automotive industry

ERIK GALLON  
ANTON PETERSSON

Tutor, Chalmers: Alvar Palm

Department of Technology Management and Economics

Division of Innovation and R&D Management

CHALMERS UNIVERSITY OF TECHNOLOGY

Gothenburg, Sweden 2019

Key success factors in the Front End of Innovation

A case study on a technology driven SME in the automotive industry

Gallon, E & Petersson, A

© Gallon, E. & Petersson, A., 2019.

Master's Thesis E 2019: 025

Department of Technology Management and Economics  
Division of Innovation and R&D Management  
Chalmers University of Technology

SE-412 96 Gothenburg, Sweden  
Telephone: + 46 (0)31-772 1000

## ACKNOWLEDGEMENT

---

First, we would like to express our gratitude to the father, son and holy spirit. Without your spiritual guidance and support this thesis would not have been possible. When the times were as darkest you shed the light upon us. When we were lost, you showed the way. When we sinned, you forgave. For that, we are forever grateful.

Secondly, we would like to thank Alvar Palm, the supervisor of supervisors. He has throughout the course of this thesis shared valuable insights and thus, helped us finding the right scope and direction. From day one, Alvar has always been available for whatever question we have had and with quick and clear feedback allowing us to progress with the work of this thesis.

Thirdly, we would especially like to express our gratitude to the supervisors at the case company. Without your help and support this thesis would not have been possible. Additionally, we would like to express our gratitude to all the friendly employees at the case company that we have met during interviews, meetings and casual conversations, it has been a pleasure meeting all of you.

Erik Gallon & Anton Petersson

Gothenburg, 9th of June 2019

## ABSTRACT

---

Organizations today are faced with an increasingly unstable business landscape and competitive threat from competitors. Additionally, new emerging technologies are rapidly being developed which potentially could disrupt established organizations' current business models. Consequently, organizations must increase their innovativeness to stay competitive today and in the future. Front end of innovation, henceforth denoted as FEI, i.e. activities performed before an idea is turned into a project, has been brought up by researchers as a vital part of organizations ability to create new and novel products and services. Despite its importance, the research community agrees that more research is needed on the FEI, especially at smaller organizations since most of the existing research has been conducted at larger multinational organizations. Therefore, the aim of this thesis is to explore how smaller organizations execute the activities in the FEI and investigate whether existing frameworks derived from larger multinational organizations can be translated into smaller and more entrepreneurial firms.

To achieve the purpose, a qualitative case study with an abductive approach, was performed at the case company, henceforth denoted as Alpha. Semi-structured interviews, dialogues, observations and a literature study were the data collection methods. From the literature study, five key organizational success factors were identified namely; management support, creativity and corporate culture, company-wide contribution, defined focus, and understandable process. The semi-structured interviews, dialogues and observations enabled an understanding on how the case company executed and structured their FEI and enabled a comparison between the current status of the case company and the five key success factors derived from the literature study.

The findings from this thesis indicates that the success factors derived from research on larger multinational organizations is also applicable to smaller organizations. However, the findings in this thesis indicates that two of the five identified key organizational success factors need more emphasis of their importance in the literature. Firstly, the success factor management support needs to put more emphasis on the importance of ensuring underlying structures which is needed to create the fundamental conditions to allow employees of the firm to work with innovation. Secondly, findings in this thesis indicates that the success factor understandable process needs to put more emphasis on the importance of clear and predictable ownership and responsibility since it is equally important as having a clear and transparent process. This thesis contributes to the literature by providing insights into how a smaller organizations structure and executes the activities in the FEI. Additionally, this thesis contributes to the theory by studying how previous frameworks, derived from research on larger multinational organizations, could be translated into smaller and more entrepreneurial firms.

**Keywords:** Fuzzy front end, Front end of innovation, SME, Key success factors

# TABLE OF CONTENTS

---

<b>ACKNOWLEDGEMENT</b>	<b>1</b>
<b>ABSTRACT</b>	<b>2</b>
<b>LIST OF FIGURES</b>	<b>5</b>
<b>LIST OF TABLES</b>	<b>5</b>
<b>1 INTRODUCTION</b>	<b>6</b>
1.1 BACKGROUND AND PURPOSE	6
1.2 DELIMITATIONS	9
1.3 DISPOSITION	9
<b>2 METHODOLOGY</b>	<b>10</b>
2.1 STRUCTURE	10
2.2 RESEARCH APPROACH	10
2.3 RESEARCH DESIGN	11
2.4 RESEARCH METHODS	12
2.4.1 LITERATURE STUDY	12
2.4.2 INTERVIEWS	13
2.4.3 DIALOGUES	15
2.4.4 OBSERVATIONS	15
2.5 DATA ANALYSIS	15
2.6 RESEARCH ETHICS	16
<b>3 THEORETICAL FRAMEWORK</b>	<b>17</b>
3.1 INNOVATION AND PRODUCT DEVELOPMENT PROCESS	17
3.2 FRONT END OF INNOVATION	18
3.2.1 IDEA GENERATION	20
3.2.2 IDEA SELECTION	21
3.2.3 DEVELOPMENT AND COMMERCIALIZATION	22
3.3 SUCCESS FACTORS IN THE FRONT END OF INNOVATION	22
3.3.1 MANAGEMENT SUPPORT	23
3.3.2 CREATIVITY AND CORPORATE CULTURE	24
3.3.3 COMPANY-WIDE CONTRIBUTION	25
3.3.4 DEFINED FOCUS	25
3.3.5 UNDERSTANDABLE PROCESS	26
<b>4</b>	<b>27</b>

<b>5</b>	<b>RESULT</b>	<b>28</b>
<hr/>		
<b>5.1</b>	<b>ALPHA'S CURRENT PROCESS</b>	<b>28</b>
5.1.1	DISCOVER PHASE	28
5.1.2	DEFINE PHASE	30
<b>5.2</b>	<b>SUCCESS FACTORS FROM LITERATURE APPLIED TO ALPHA</b>	<b>31</b>
5.2.1	MANAGEMENT SUPPORT	31
5.2.2	CREATIVITY AND CORPORATE CULTURE	33
5.2.3	COMPANY-WIDE CONTRIBUTION	35
5.2.4	DEFINED FOCUS	36
5.2.5	UNDERSTANDABLE PROCESS	39
<b>6</b>	<b>DISCUSSION</b>	<b>43</b>
<hr/>		
<b>6.1</b>	<b>MANAGEMENT SUPPORT: MANAGEMENT SUPPORT TOGETHER WITH ORGANIZATIONAL SUPPORT HAS A CENTRAL ROLE TO SUCCEED IN THE FEI</b>	<b>43</b>
<b>6.2</b>	<b>CREATIVITY AND CORPORATE CULTURE: VITAL TO FOSTER A CREATIVE CULTURE WITH THE "RIGHT" INDIVIDUALS</b>	<b>45</b>
<b>6.3</b>	<b>COMPANY-WIDE CONTRIBUTION: INNOVATION MUST COME FROM THE WHOLE ORGANIZATION, AND NOT ONLY FROM A SINGLE ENTITY</b>	<b>46</b>
<b>6.4</b>	<b>DEFINED FOCUS: PRIORITIZATIONS OF INNOVATION PROJECTS SHOULD ALIGN WITH THE OVERALL STRATEGY OF THE ORGANIZATION</b>	<b>47</b>
<b>6.5</b>	<b>UNDERSTANDABLE PROCESS: IMPORTANT THAT THE INNOVATION PROCESS IS CLEAR ENOUGH TO GUIDE EMPLOYEES IN <i>HOW</i> TO WORK WITH INNOVATION AND <i>WHO</i> HAS THE OWNERSHIP OF THE PROJECT</b>	<b>50</b>
<b>7</b>	<b>CONCLUSION</b>	<b>55</b>
<hr/>		
	<b>REFERENCES</b>	<b>57</b>
<hr/>		



## LIST OF FIGURES

---

Figure 1: The development funnel, illustrating the process of developing ideas into commercialized products and/or services (Koen et al., 2002) – Page 18

Figure 2: Schematic picture of the discover, define, design, develop & deliver phases at Alpha – Page 29

Figure 3: Overview of the FEI process at Alpha – Page 31

## LIST OF TABLES

---

Table 1: Overview of interviews – Page 14

# 1 INTRODUCTION

---

*The following chapter will give a background to the study in which context and significance are described. The chapter will also describe the reports purpose, research question, disposition and delimitations.*

## 1.1 BACKGROUND AND PURPOSE

In today's business climate, organizations all over the world are facing an increasing volatile business landscape with new emerging challenges. These challenges might best be exemplified by the stagnating, and in some cases even declining economic growth, coupled with the constantly increasing competitive threat from both competitors within an industry, but also from new emerging technologies. In addition, the increased competition can also be derived from globalization which lets customers choose products from all over the world (Hirst et al., 2015). The globalization is characterized by oversea investments and cross-border exchange (Sturgeon, Memedovic, Biesebroeck & Gereffi, 2009). Consequently, companies have to be flexible in order to be competitive, both in terms of strategy and operations, to cope with the pressure of change (Feng & Zhang, 1998). Interestingly, the rate of change is increasing which can be derived from the decreasing average lifespan of S&P 500 companies (Foster, 2012).

The automotive industry is not an exception with disruptive trends taking over and transforming the rules of the mobility sector. In view of this, the automotive industry will probably transform more in the next 5-10 years than the last 50 years according to Mary Barra, CEO General Motors (Barra, 2016). Besides changes due to globalization, the automotive industry is also pressured by socio-political forces and technological advancements (Schulze et al., 2015). Historically, the automotive industry has been characterized by a dominant design for decades, but electrification of cars, autonomous driving, shared mobility and connectivity are some of the few trends that are believed to transform the industry completely (Schulze et al., 2015; Mckinsey, 2016). Besides, since hardware is shifting from being a differentiated product to a commodity due to digitalization (Burkacky et al., 2018), the automotive industry's profitability head towards software. This can also be derived from the fact that the world's leading automotive OEMs establish themselves in Silicon Valley (Nelson, 2014), and that software driven companies such as Google and Apple are entering the industry (Patterson, 2017). In order to compete on the changing automotive market with multiple possible outcomes (Geels, 2012), companies have to offer solutions accordingly. Consequently, companies have to be flexible strategically and develop capabilities for innovation.

According to Daher (2016), innovative ability is a critical factor since it is central to maintaining a competitive development of solutions (Dougherty, 1992), which is seen as particularly important for organizations that operate in environments that are unpredictable and changeable (Morgan, 2006). Innovation in this study, will be defined as something "newness" (Gupta et al., 2007), that has the ability to become commercialized (Lorenz, 2010). This is something that several scholars, such as Dess and Picken (2000) and Tushman and O'Reilly (1996) views as a 'must' in order to survive in the long term. Likewise, articles from notable management journals and titles of books have used the phrase 'Innovate or Die' for decades, referring to innovation as a significant factor for long term survival for companies, otherwise they will perish and "die" (among others Wall, 2014; Harper & Porter, 2011; Economist, 1999). Consequently, to generate competitive advantage and superior performance, it's necessary for organizations in today's ever-changing business environment to be innovative.

Particularly, in order to be innovative, innovative activities in form of innovation projects needs to be somewhat controlled and organized (Chiesa et al., 2009). Precedent studies within the area suggest that to accomplish successful innovation projects it is important to have supportive leadership with right underlying conditions and staff (Cozijnsen et al., 2000; Chen, 2017), mechanisms for trust as it contributes to successful collaboration and effective teams (Wu et al., 2017), efficient communication for quality of potent information (Cosmetto et al., 2016) and organized time management to reduce risks for failures (Chen, 2017). Additionally, success of innovation projects is strongly linked to the organization's governance and structure (Morgan, 2006), where Burns and Stalker (1961) distinguish two concepts; organic and mechanistic organizations. The organic organization is mainly characterized by flexible control and structure with low formalization, low vertical differentiation and decentralization of decisions (Damanpour 1991). By contrast, the mechanistic organization features standardization with more governance, centralized decisions and formal rules (Chenhall, 2003). Previous research clearly suggest that an organic organization is favorable for innovation (Morgan, 2006; Damanpour, 1991, Ylinen & Gullkvist, 2014). However, to some extent, a balance with supplemented mechanistic governance is preferred (Sundbo, 1996). This also goes in line with West (2003), who argues that a decentralization of decisions is prosperous to generate creative ideas complemented with centralized decisions for implementation.

To allow the ongoing focus on innovation, the challenge for organizations is to build structures and processes accordingly (Bilton, 2009). According to Teece et al. (1997), the long-term success for organisations lies within the ability to integrate existing expertise with concurrent development of new capabilities. In view of this, organizations face the quandary of these two opposing activities which differs in terms of organizational structure, processes, culture and talent (Levinthal & March, 1993). This quandary is also known as organizational ambidexterity, which according to O'Reilly and Tushman (2013) is defined as "the ability of an organization to both explore and exploit". In other words, the ability of organizations to compete in both mature technologies and new technologies. where the latter is more focused towards flexibility, experimentation and radical innovation. This emphasizes the need for organizations to unite conventional business models with novel, digital technology focused business models within the same organizational structures to adapt to changing markets in order to find a suitable balance.

As previously mentioned, innovation is crucial for organizations to generate long term competitive advantages (Daher 2016). The challenge organizations face when dealing with innovation or new product development is to bring an idea into a successful commercialization in an effective and efficient manner (Wheelwright & Clark 1992; Rafinejad 2007). This challenge means that organizations must generate both a quantity and quality of ideas to provide the focal organization with an enough idea base where organizations can select the best idea for further development. When the idea has been selected for further development it must be guided through the various stages/phases usually existing in the development phase of innovation or new product development (Wheelwright & Clark 1992). But when organizations are faced with the challenge of increasing their innovative capability, the front-end of innovation [henceforth denoted as FEI] is often overlooked with regards to top management support, attention and resources (Riel et. al. 2013). Consequently, top management focus on the later and more defined stages of product development despite often knowing that there is huge potential to leverage the potential of innovation in the early stages (Gassmann & Schweitzer 2014). This study will use the definition of FEI brought up by Stevens (2014) and Koen et al. (2011) as the activities carried out before an idea is turned into an actual project. According to Nobelius and Trygg

(2002 pp.1), it is in the FEI that the “largest potential for improvement at the least effort possible” can be made.

While studying the field of front-end of innovation, the majority of the current research is often based on clearly defined large divisionalized organizations (Riel, Neumann & Tichkiewitch 2013; Stevens 2004; Koen et. al. 2001; Veryzer 1998; Holahan et. al. 2014; Khurana & Rosenthal 1997). The problem is that there is a gap in the research for SME’s. These companies can often be characterized as small organizations with rapid phases of expansions, a restricted flow of resources and from time to time, no product/service on the market. These companies can evolve through large multinational organizations that wants to meet a new demand on existing markets, or emerging markets. SMEs management, unlike large organizations, rarely has staff functions available due to hefty expansions and lack of resources but needs to lead the day-to-day work and innovation projects with the company’s existing resources. Furthermore, there is a strong need for management to enable the organization and individual’s adaptability to FEI and surprisingly there is little research about the subject, especially regarding SMEs.

In the move towards an ever-changing business environment with high competition, FEI is a vital phase in the innovation process in order to work effectively for long term success. Despite research showing the benefits of innovation, the practical problem lies within the balance of exploration and exploitation where organizations tend to stick to the daily work, especially when the organization is experiencing economically volatile times (Tushman, Smith, & Binns, 2011). Just focusing on the execution of the daily work means that the business will not maintain competitiveness in a longer perspective in the rapidly growing market (March, 1991). FEI in itself is extremely uncertain and often overlooked, where organizations often takes decisions to focus on this particular phase, however without enough emphasis on resources. Previous research has shown that it's difficult for larger organizations to focus on FEI, where SMEs generally have no clear structure for the innovation process. In order to create an increasing understanding of the innovation processes for SMEs, and especially within FEI, more research is required. The role of management in the innovation process is central and thus the knowledge and understanding of FEI needs to be improved for SMEs. To conclude, there is a need for further theoretical development that connects the literature of FEI to SMEs by exploring how these organizations manage the innovation process. Therefore, the purpose of this study is to explore what key organizational components that are needed for SMEs in order to succeed in the FEI. In addition, the study also aims to investigate whether existing frameworks derived from larger multinational organizations can be translated into smaller and more entrepreneurial firms. Alpha, a SME in the automotive industry, with a vision to transform the market, acted as a case company in this study. With this in mind, the thesis will start with an investigation of how Alpha execute early stages of innovation and how Alpha evaluate and prioritize innovation projects to establish deeper understanding of how technology driven SMEs operates in the front end of innovation. In order to achieve the purpose, a research question have been formulated:

**RQ:** What are the key organizational components needed for technology driven SMEs to succeed in the front-end of innovation?

## 1.2 DELIMITATIONS

As the research question implies the focus of this thesis is on the front end of innovation. Consequently, later stages in the product/service development process will not be covered or assessed. Additionally, there will be no focus on assessing or developing specific tactics, tools or methods to employ in the front end of innovation. Instead the focus will be on identifying and assessing the needed organizational structures and factors in the front end of innovation. The study will be conducted at one company active in one industry and the empirical data will be mainly based on interviews in how managers and employees perceive the internal environment and organizational capabilities when working in the front end of innovation. By request from the case company Alpha, all direct and indirect references to the company have been omitted.

## 1.3 DISPOSITION

This report constitutes of six chapters of which the first chapter, *Introduction*, describes the study's context and importance. Additionally, the purpose, research question and delimitations are also introduced. In chapter two, *Method*, a description of the chosen methodology in this study is given. The different moments of the study are described to make the progress of this study perceptible. Additionally, a recitation of the data collection and analysis is given. In chapter three, *Theoretical Framework*, the different theoretical principles which this study is based upon are described. In the first part, of this chapter the term innovation is introduced. In the second part, literature related to key characteristics and processes in the FEI is presented. In the third and final part, key success factors identified from the literature study are presented. In chapter four, *Result*, the reader is provided with an insight into the current situation at the case company, Alpha. This chapter is divided into two parts. The first part describes the current process in the FEI and the second part presents the findings related to the identified key success factors. In fifth chapter, *Discussion*, the empirical findings are compared and analyzed together with the theory derived from the theoretical framework. The sixth and final chapter, presents the conclusions and the theoretical contributions of this study.

## 2 METHODOLOGY

---

*The following chapter will describe the study's methodology in order to clarify motives of the chosen research approach to achieve the aim of the study. Moments explained are research approach, research design, research methods, data analysis and research quality.*

### 2.1 STRUCTURE

The study was initiated in January 2019 through a meeting between one of Alpha's departmental managers, project managers and the authors, which resulted in a current situation description of Alpha. Furthermore, during this meeting a purpose was elaborated that generated an initial research question. The data collection began the second week of January 2019, mainly to get an enhanced understanding of the chosen case company, which then evolved into more in-depth interviews that progressed to the end of April. Parallel throughout the study a literature study was conducted, which formed the basis for the report's theoretical framework and deals with essential theory compatible with the subject. The literature study was mainly conducted in February 2019, and then supplemented during the progress of the study. The theoretical framework also worked as a basis for interpreting and analyzing collected data. Then, all the aggregated data was analyzed and compiled into specific categories. Based on the analysis of the empirical data and the literature study, the research question was addressed. The study processed sensitive information, both regarding projects and the business, which resulted in all authors signing a confidentiality agreement at the first meeting. In view of this, employees and the case company are not referred to by name in the data.

### 2.2 RESEARCH APPROACH

In the field of research, the definition of orientation approaches ranges from very specific to rather general where the two central ones being either quantitative or qualitative (Bryman & Bell, 2015; Remenyi, Williams, Money & Swartz, 1998). According to Bryman (2012), the quantitative research is based on the premise that an objective reality exists, which can be mapped through statistical studies of large datasets and thus results in quantifiable and comparable outcomes. As for qualitative research, unlike its quantitative counterpart, emphasises on words and interpretations, where it is essential to understand how individuals perceive and interpret reality (Bryman, 2012; Holme & Solvang, 1997).

The purpose of this study is to explore what key organizational components that are needed for SMEs in order to succeed in the FEI. In addition, the study also aims to investigate whether existing frameworks derived from larger multinational organizations can be translated into smaller and more entrepreneurial firms. This was done by interviewing management and employees at the chosen case company and experts within the field, and thus generated subjective data of the specific situation. Hence, a qualitative research approach was most compatible (Bryman & Bell, 2015). Moreover, qualitative methodology is also preferred when studies are carried out in the reality being investigated and when the collection and analysis of data takes place interactively (Holme & Solvang, 1991). This is also something that both Yin (1984) and Bryman (2012) emphasize as prerequisites for qualitative method approaches. In addition, existing studies of the FEI focuses on larger multinational organizations, which does not always fit into the setting of a SME (Floren et al., 2017; Aquil, 2013; Turner et al., 2012; Bos-Brouwers, 2010). Thus, further studies that support theory are required, which is also a suitable starting point when using a qualitative methodology. In comparison with qualitative

methodology, quantitative methodology implies more formalized working methods where analysis of processed data is based on testable hypotheses (Holme & Solvang, 1991). Processed data means that empirical and quantifiable data are systematically collected and summarized in statistical form, which could be used to supplement and support the qualitative data. However, due to limitations, quantitative data was not used in this study.

Regarding the relation between theory and empirical data, two approaches can be distinguished: deductive and inductive (e.g. Eriksson and Wiedersheim-Paul, 2008). The deductive approach is commonly used in quantitative studies, where hypotheses are formulated based on theory and then studied through observations of reality. The inductive approach turns on reasoning and is based on that theory and models emerges from empirical observations. This also goes in line with Bryman and Bell (2015). However, Kirkeby (1994) remarks both approaches individually for not having the capacity to support the development of anything that is not already known and Bryman & Bell (2015) comments that the distinction between them is not always explicitly stated.

To adequately fulfill the research objective, the authors needed to understand the socially constructed meanings expressed by the interviewees. The choice of research approach was based on the relationship between empirical data and theory, where the abductive approach was considered most suitable, which includes both the deductive and inductive approach (Kirkeby, 1994; Alvesson & Sköldbberg, 2017; Dubois & Gadde, 2002). Moreover, this formed a back-and-forth process of both theory and empirical data (Bryman & Bell, 2015). Additionally, this goes in line with Patel and Davidson's (2003) and Wallén's (1996) description of the abductive approach, where empirical information supplements the study with existing theory, which is consistent with the study's alternate focus. This means that the authors were able to exploit their theoretical biases that were internalized before entering the data collection process and combine these understandings with the empirical data. In brief, the back-and-forth process follows Dubois and Gadde's (2004) systematic combining, which is a process where empirical fieldwork, theoretical framework and a case analysis evolve simultaneously. Also, Eriksson and Wiedersheim-Paul (2008) emphasize the great importance to continuously study the information obtained during the course of the study, whereby data obtained has been analyzed in parallel with other work. Collected data has been set against the theoretical framework and has thus resulted in new perspectives.

In order to ensure that the collected data is credible, it should, according to Eriksson and Wiedersheim-Paul (2008), be critically reviewed. Consequently, Eriksson and Wiedersheim-Paul (2008) emphasize the importance of understanding the relevance of the data and by fulfilling four criteria, data can be considered credible. Data should be expressed in the present and not be outdated. It is also important for the researcher to be fully aware of the possibility of bias in data through personal interests. Sources may also be interdependent and therefore primary sources should be preferred to secondary sources. In addition, the data must be authentic. All of these four criteria have been the basis for the acquisition of data in this study.

### 2.3 RESEARCH DESIGN

The choice of research design in this study has been a single holistic case study, more specifically at the headquarters of Alpha, in the quest to explore and comprehend how a technology driven company build capabilities for innovation. Generally, a case study is characterized by research that involves empirical analysis of a specific problem in its specific context and incorporates several sources of evidence (e.g. Robson, 2002). According to Jacobsen (2002), Yin (2014) and Saunders et al. (2009), a case study design is most suitable

when the researchers want to gain a deeper understanding of a phenomenon and when the researchers want to gain in-depth knowledge about a particular context with involved procedures, which is in line with this study. Also, since the approach in this study is exploratory and focused on opinions and processes in a non-synthetic setting, a case study methodology was considered most adequate (Denscombe, 2010; Voss et al., 2002). To further elaborate the choice of a case study, Saunders et al. (2009) emphasize the potential for a case study to answer questions characterized by ‘what?’, ‘how?’ and ‘why?’, which is in accordance with the research question of this study. Specifically, *what* are the key organizational components needed for a technology driven SME to succeed in the front-end of innovation. The case company Alpha can be characterized as a technology driven SME in the automotive industry.

## 2.4 RESEARCH METHODS

*In this section the research methods used to conduct this report will be presented and motivated. Initially, the conduction of the literature study will be described followed by a description and reasoning behind the interview process. Subsequently, conversations and observations will be presented.*

### 2.4.1 Literature study

To gain a comprehensive understanding about the topic and subsequently enabling an analysis of the collected data a literature study was performed to create a theoretical framework from which the study was based upon. The literature study begun the second week of January and continued throughout the study. The purpose of continuing the literature study throughout the study was to enable a flexible and iterative process to create the theoretical framework. Consequently, insights from interviews, conversations and observations gained during the study could be used to divert the literature study into new directions. To be able to generate a comprehensive scope for the literature several different search methods were applied in the literature study. In the initial phases the systematic search method was used where key words are used to find suitable literature (Rienecker & Stray, 2004). The key words used for the literature study: innovation management, front end of innovation, fuzzy front end and finally, innovation and product development processes. Additionally, a method called chain search was applied where the sources of the found literature is used to gain a deeper understanding and more detailed knowledge in the specific fields of research. The literature study focused on academic literature, articles, journals and books.

Primary sources in this study, mainly regarding principles associated with FEI, are predominantly reliable because of the originators' personal production of these theories and models. Given that most of the sources are based and built upon each other, a one-sided positive picture of FEI could be noted, which the authors took into consideration. In addition, a great deal of chain search was done via the source list from literary works, which can lead to other essential areas being missed because the sources are usually dependent and based on each other. Because of this, consultations were sought from a researcher (see Table 1) to avoid a lack of sources. When literature was considered interdependent, especially in FEI, the authors actively sought for criticism of FEI to counteract a one-sided image. The systematic search of databases also entailed critical moments, including that only the specific keyword is used, and results are prioritized according to relevance, which can contribute to new research in the field being overlooked. In addition, there is a risk that research with new approaches to the subject will be missed.



### 2.4.2 Interviews

Interviews was the main data collection methods used in this thesis where a semi-structured approach was used during all interviews. The reasoning behind using this approach was to have a list of questions prepared but at the same time allow the interviewer to be flexible with the order of the question and to follow up on unforeseen issues that might arise during the interview. Additionally, semi-structured interviews allow interviewees to elaborate and develop their opinions which is not possible in a structured interview (Denscombe, 2009) and reduces the risk of bias from the interviewees (Bryman & Bell, 2007). Two interview streams were used in this thesis, namely internal interviews and external interviews.

Internal interviews were held with employees and managers within Alpha to gain an in-depth comprehensive understanding about the current situation and way of work at Alpha. Additionally, the aim of these interviews was to map out the current processes and the interviewees subjective opinion about these processes based on his/her perspective. Therefore, the authors abstained from asking leading and unclear questions. To enable a comprehensive understanding about the current situation at Alpha interviews were held with employees from various departments. External interviews were held with other organizations, and with a researcher active within the field of research, i.e. front end of innovation. The reasoning behind interviewing other organizations was to gain an understanding how organizations with similarities with Alpha in terms of size, market and ownership structure worked with the early stages of innovation which also was the basis of the selection of the interviewees. Finally, interviews were held with an expert within the field of early stage of innovation to gain additional valuable insights. The selection of interviewees for the external interviews were made solely by the authors.

All interviews were face-to-face and attended by the two authors, one responsible for taking notes while the other asked the questions. During all interviews the interviewee were informed about the anonymity and asked if a recording could be made. Different interview guides were used for the internal and external interviews where the interview guide was not tested before implemented, instead adjustments were made continuously when feedback from the interviews was received. All interviews lasted for approximately one hour. In cases where the interviewed person was reserved, the interview sessions began with a general dialogue on various subjects, to produce a climate where the person could respond openly. To more clearly illustrate the number of interviews, see Table 1 below (next page).

<b>Internal interviews at Alpha</b>	<b>Amount of semi structured interviews</b>
Executive	1
Manager	10
Employee	5
<b>External interviews</b>	
Innovation consultant – Consultancy bureau	1
Innovation manager – Automotive manufacturer	1
Executive – Automotive manufacturer	1
Researcher – Chalmers University of Technology	1
<b>Total</b>	<b>20</b>

*Table 1: Overview of interviews*

The selection of the interviewees was done with assistance from the contact person at the case company Alpha with a non-probability sample. The sample was chosen with a typical selection, where subjects were chosen subjectively along how well they were thought to have an understanding of the subject of this study. Furthermore, all employees at the case company that works directly with the FEI were interviewed as well as employees and managers across six different departments to get the most accurate picture of the reality as possible. However, there is still a major risk that the sample does not represent the entire workforce, since all departments were not interviewed. There is also a risk with the subjective selection of interviewees done by the supervisor at the case company since the supervisor had a great influence in the selection process and therefore could have chosen interviewees with positive or specific opinions regarding the subject of the study. Also, there is a risk with the subjective answers from interviewees, which can be troublesome to interpret (Ryen, 2004), which were taken into consideration when coding data.

A high degree of both reliability and validity are consistent with high quality. Reliability is high when random errors does not occur in a study's results and when the study is stable (Troost, 2001). To put it simply, this means that a consistent result of the study should be repeated in similar circumstances if the study is carried out again. Validity means that the study should not contain systematic errors and only measure what is planned (Troost, 2001). Validity can be divided into internal and external validity, where internal validity refers to the level of credibility and external validity refers to transferability. However, it is very complicated to determine whether different methods measure what they are intended for (Lekvall & Wahlbin, 1993). Moreover, validity is also linked to reliability by the fact that if the validity is achieved, the reliability is strengthened (Lincoln & Guba 1985).

It is complicated to reason about the reliability of qualitative approaches, since the data is subjective and is based on specific situations, which is more or less impossible to generate an exact repetition on (Silverman, 2016). In order to deal with reliability, the design of the interview questions was as uncomplicated as possible. Moreover, unsuitable interview times and interview environments, such as a lobby or a cafeteria, were also avoided. Instead, separate conference rooms were used during reasonable hours during the day. With regard to previous remodeling and the constant change of processes that takes place at the case company, this can adversely affect the reliability by allowing staff to have temporary opinions and settings after

new implementations. Thus, there is a risk that personnel exaggerate the current situation when the person concerned participated in previous projects, which may have caused a misleading picture of reality. In addition, to avoid a bias from different level of managers, where managers describe their specific situation from their own experience, interviews were conducted at all levels and compared against each other. Also, the interviews were conducted at different departments with employees originating from several nationalities and hence, their personal and cultural perception might have influenced the answers. Interestingly, the majority of interviews incorporated an advanced automotive setting, including difficult words and abbreviations. However, this did not become a problem since one of the authors being well-grounded in the automotive industry.

The choice of methodology has been described as distinctly as possible, which according to Bryman (2002) may be complicated in qualitative studies. This also directly affects the validity negatively and thus a more comprehensive level of detail was sought regarding the data in order to achieve a higher degree of validity. Semi-structured interviews with employees that touched on detailed situations, have been verified by cross-checking answers across departments at the case company. In order to further increase the degree of validity, interview numbers have been reviewed regarding the connection between the study's purpose and the questions that were asked, which Lekvall and Wahlbin (1993) contemplate as a method for strengthening validity.

#### 2.4.3 Dialogues

A dialogue is according to Jacobsson (2010) defined as a calm and relaxed conversation where opinions and experiences are expressed. Additionally, a conversation is informal, i.e. it is not following a manuscript, nor is it structurally performed. The conversations that were performed were random and took place in different places, with different employees and usually lasted five minutes. Each conversation was improvised where each specific employee and his/her position was taken into consideration when performing the conversation. The purpose of the conversations was to enable the collection of data that had been missed or left out during the interviews.

#### 2.4.4 Observations

Part of the data collection for this thesis was made through personal observations made at Alpha since, on average, three days per week was spent at their headquarters. The observations were made by listening to the daily work and by attending several meetings. A living document was used to document observations made. Additionally, notes were taken during the meetings that were attended. The purpose of the observations was to complement the information retrieved from the interviews and dialogues. Furthermore, insights made from observations was, on several occasions, used as input for the interviews.

### 2.5 DATA ANALYSIS

All of the semi-structured interviews conducted, in combination with dialogues and observations, were analyzed and compiled into specific themes at the end of March 2019. Based on these themes and the literature study, various components needed to succeed in early stages of innovation were raised. All of the collected data from the interviews were categorized based on three groups of interviewees: employees from the innovation department, departmental managers and experts, in which the analysis followed. With regards to the qualitative data collected, the analysis could be performed interactively during the process of the study (Bryman, 2002; Miles & Huberman, 1994). However, the approach for qualitative analysis is

somewhat vague and the interpretation is more demanding with regards to compression of data and analysis of patterns (Åhlström & Karlsson, 2009).

The qualitative analysis was carried out with a subsequent three-step analysis according to Denscombe (2009), which includes; preparation, familiarity and interpretation of data. However, the steps unfolded to not fully follow in sequence, as the analysis process has an iterative character (Denscombe, 2009; Yin, 2013; Graneheim & Lundman, 2004). Firstly, data was transcribed to simplify the analysis and to increase the familiarity with the data. Thereafter, data was organized together based on the interview question, and this was also done occasionally alongside the collection, which allowed for an easier identification of deficiencies and reduced the perception of the analysis scope (Miles and Huberman, 1994). Also, directly after all interviews, time was allocated for collective reflection and all material was summarized which meant that meaningless information was excluded.

After the transcription and organizing, collected data were analyzed by codification of the data. In this case, codes were labels that were added to the data and the purpose of encoding is to methodically move towards a higher conceptual level (Denscombe 2009, Yin 2013). The recordings and notes were studied, then pieces and sentences were assigned different codes where the codes were divided into different categories. Specifically, categories were collections of data that share similar characteristics (Graneheim & Lundman 2004). For example, if two interviewees shared the same feeling or opinion about a specific question, then these two findings were coded in the same category. Additionally, based on these categories, themes and connections between the interviews were identified. This provided a hierarchy from raw data with codes, categories and finally more general themes which were illustrated via a screen to illustrate subdivided areas. As specific themes evolved, it became evident whether an extension of data was required through continued data collection.

## 2.6 RESEARCH ETHICS

To conduct an ethical research, it is according to Vetenskapsrådet (2017) important to follow four principles. The first principle is the *consent of information* which means that all participants of a study must be given enough information about the scope and purpose of the study before accepting to be a part of it. The second principle *compliance* refers to the importance of given each participant in the study the right to, at any point in time, withdraw their participation from the study. The third principle, *confidentiality* is about the importance of handling sensitive corporate and individual data and/or information in a delicate way. The fourth and final principle *usage*, refers to the importance of only collected data and information about individuals if, and only if, they are used for the research (ibid.).

Throughout this thesis all four principles were taken into consideration. In all aspects of data collection, i.e. interviews and dialogues the participants were given information about the topic and purpose of this thesis and that all data collected would be anonymous. Additionally, all participants were explained to that participation in the study was voluntary and that they could, at any point in time, withdraw from the study. Participants in the interviews or dialogues were also informed that they did not have answer a question if they did not want to. The study processed sensitive information, both regarding projects and the business, which resulted in all authors signing a confidentiality agreement at the first meeting.

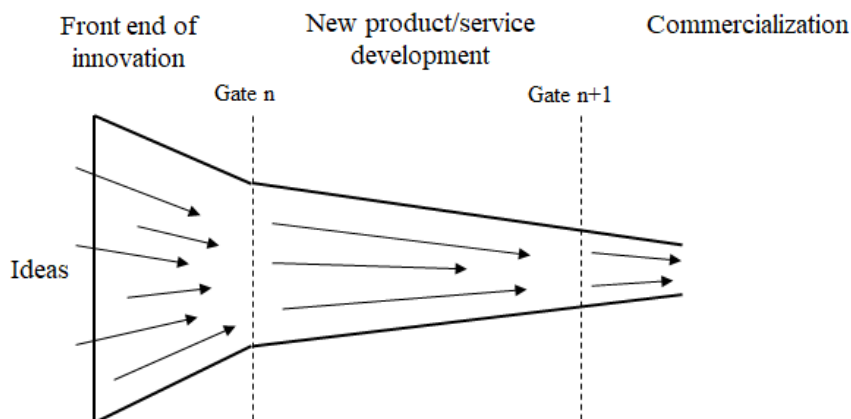
### 3 THEORETICAL FRAMEWORK

*The following chapter will describe the theoretical framework which this thesis is based upon. The aim of this chapter is to present the most applicable theories and give the reader a comprehensive understanding on the process, key characteristics as well as the success factors needed in the FEI. In the first part the term innovation is introduced and presented. In the second part literature related to the key characteristics and processes in the FEI is reviewed. In the third and final part, key success factors needed in the FEI are presented.*

#### 3.1 INNOVATION AND PRODUCT DEVELOPMENT PROCESS

The term innovation is broad, and the literature provides an excess of definitions. In its most basic form innovation is something new or “newness” (Gupta et al. 2007). However, this definition is not sufficient according to Lorenz (2010) as an innovation is not only something new, it must also be commercialized in order to be called an innovation. Additionally, Lorenz (2010) defines the term innovation along three dimensions, namely: Type of Innovation, Newness of Innovation and Degree of Innovation. The type of innovation can according to Lorenz (2010) be divided into product, process, organizational, service to name a few whereas the newness of innovation refers to for whom the innovation is new, i.e. if the innovation is new for an individual, for a department, for a company and so forth. The last dimension, degree of innovation, or innovativeness refers to the varying impact an innovation have. The degree of innovation ranges from low risk incremental innovations to higher risk and more resource demanding radical innovations (Lorenz, 2010).

Today’s competitive environment with globalization and rapid technology development has increased the pressure on companies to be more innovative to stay competitive. Consequently, there is an increased pressure for organizations to structure their development process to be faster and more efficient to create competitive advantages, i.e. bring ideas into successful commercialization (Wheelwright & Clark, 1992; Rafinejad, 2007; Daher, 2016). The development funnel illustrated the process organizations ideally go through when developing new products/services or processes (Wheelwright & Clark, 1992). As seen in figure 1, it starts with an investigation where multiple ideas are identified, screened and later selected for further development, i.e. “moving an idea to reality” (pp. 111). Nilsson (2015) has a similar description of the process as “the development and implementation of new ideas by people who over time engage in transactions with others within an institutional context” (pp. 15).



*Figure 1: The development funnel, illustrating the process of developing ideas into commercialized products and/or services (Koen et. al. 2002).*

Wheelwright and Clark (1992) states three main challenges related to the overall innovation and product development process. First, to widen the mouth of the funnel to generate many prospective ideas. Second, to establish screening and review activities to ensure that the most attractive ideas and concepts are selected and prioritized. Lastly, the third challenge is to ensure that the selected projects meet the anticipated goals and objectives. According to Visser et al. (2010) there is a need for structure and formalized processes in the innovation and product development process since it is positively correlated with overall innovation performance. Ahmed (1998) supports this statement by stating that a lack of structure and formality in the process can reduce the innovation performance and create a hinder for innovation since it can create a negative influence on the climate and culture in organizations. Additionally, Ahmed (1998) argues that the strive and pursuit of innovation should be emphasized in the whole organization, i.e. it should be the entire organization's responsibility and no single departments.

As mentioned in the introduction there is a gap in the current research on front end of innovation. The majority of the research focuses on large multinational organizations active in different industries, e.g. ranging from automotive to semiconductors (Riel, Neumann & Tichkiewitch, 2013; Stevens, 2004; Koen et al., 2001; Veryzer, 1998; Holahan et al., 2014; Khurana & Rosenthal, 1997). Consequently, according to Veryzer (1998) there is a need to investigate how these existing frameworks can be translated into smaller and more entrepreneurial firms. This statement is supported by Floren et al. (2017) who argues for the need of additional research how the existing frameworks can be used in a different organizational context different from larger multinational organizations. This goes in line with Aquil (2013), Turner et al. (2012) and Bos-Brouwers (2010) who stressed the issue of existing studies, when it comes to managing ideas, focusing on larger multinational organizations and thus not always fit into the setting of an SME. In the subsequent chapter will the established studies on the front end of innovation be presented.

### 3.2 FRONT END OF INNOVATION

The Front End of Innovation, henceforth denoted as FEI, is often referred as the “Fuzzy Front End” (Nobelius & Trygg, 2002; Riel, Neumann & Tichkiewitch, 2013; Thanasopon, Papadopoulos & Vidgen, 2015) and refers to the activities carried out before an idea turns into an actual project (Stevens, 2014). Another similar description brought up by Koen et al. (2011) who describe the FEI as the activities that come before the more “formal and well-structured new product and process development or stage gate process” (pp. 49). Previous research within the field of FEI has sought to develop one universal/optimal process for the FEI, but this is according to Nobelius and Trygg (2002) and Koen et al. (2001) not suitable. The reason for this is because it does not consider relevant circumstance such as industry, company or project characteristics, i.e. a business analysis might be important for a derivative project but of lesser importance for a research or radical project (Nobelius & Trygg, 2002). According to Holahan et al. (2014) and Veryzer (1998) it is in the FEI where ideas created/generated and subsequently selected based on opportunities and customer needs. According to Koen et al. (2001) the activities in the FEI is mainly driven by the culture and climate of companies as well as leadership.

During the FEI the “fuzziness” is at maximum due to the high uncertainty that characterize the early stages of innovation (Stevens, 2014). The uncertainty, or fuzziness, is according to Lane and Maxfield (2005) linked to lack of accessible information regarding customer preferences, technical solutions, environment, the actions and reactions from competitors and the uncertainty about management support for a specific idea or concept. Consequently, rational decision

making is difficult because the consequences of a decision is impossible to anticipate (Lane & Maxfield, 2005). According to Stevens (2014) and Frishammar et al. (2011) there are three factors influencing the level of “fuzziness” namely; uncertainty, equivocality and complexity. The first factor uncertainty refers to the difference between the information needed to accomplish a task and the information available. Drivers of uncertainty can be divided into technology uncertainty and market uncertainty, where technology uncertainty refers to potential knowledge gaps in technology requirement and potential technical challenges: Market uncertainty refers to the uncertainty about the customer needs, competitors’ actions, the pricing of a product or service and the overall market situation (Frishammar et al., 2011; Vernworn et al., 2008).

According to a study by Thanasopon et al. (2015) market uncertainty can be reduced by involving customers/users in FEI, co-creation with competitors and by benchmarking the focal product/service/solution under development against similar products/services that already exists on the market. However, the risk of using these traditional techniques and methods is that the potential to create radical innovations is reduced i.e. these methods are more useful for creating incremental innovations (ibid.). Consequently, short-term financial success is favored and not long-term financial and strategic success. In the same study by Thanasopon et al. (2015) a reduction in technical uncertainty was found to have no impact on financial success or non-financial success of service innovations. Unlike service innovations, Moos et al. (2013) and Vernworn et al. (2008) argues that a reduction of technical uncertainty is more important for product innovations. A way for organizations to reduce the level of uncertainty is by collecting data and information until a rational and fact-based decision is possible. Involvement of customers and/or users in the FEI can result in generation of better ideas, reduction of development times and improvement of the screening of ideas (Vernworn et al., 2008; Alam, 2006). Moreover, Steven et al. (2014) states that recruiting the employees with new competencies, using a guiding vision also are alternatives to reduce the level of uncertainty.

The second factor, equivocality refers to the challenge of processing and understanding the data and/or knowledge, i.e. when a set of data has more than one possible meaning, and not to the challenge of attaining data or knowledge. According to Crossan et al. (1990) one way of reducing the level of equivocality is by involving people with specific expertise. The third factor complexity can be defined as “when a number of parts or their intricacy are too large to be processes simple, complexity becomes a challenge for rational decision making” (Stevens, 2014, pp. 432). Complexity in the FEI can according to Stevens (2014) be managed by dividing the complex problem faced into several manageable sub-problems.

There is an ongoing discussion in the research community regarding to which extent the processes and activities in the FEI should be formalized. According to Gassmann and Schweitzer (2014) there is a balancing act between exploiting the current capabilities and opportunities and exploring new one, between stable processes and flexible. Kim and Wilemon (2002) argues that a formalized process in the FEI has more advantages than drawback. The need for a formalized process is supported by Riel, Neumann and Tichkiewitch (2013) who argues that there is a need to act more systematic in the FEI. Holahan et al. (2014) comes to a similar conclusion in their study where it was found that organizations manage radical innovations more inflexible compared to incremental innovations. In their study it was found that more incremental ideas were more likely to skip steps and combine gates to reduce development times unlike more radical ideas.

On the other hand, Nobelius and Trygg (2002) argues that flexibility in the FEI should be prioritized. Additionally, they state that there is a need for a flexible and customized process for each project. Backman, Börjesson and Setterberg (2007) argues that one must distinguish between the characteristics of the projects to set an appropriate level of formality in the process and activities. The need for flexibility is especially important when it comes to radical innovations while defined processes is suitable for incremental innovations (ibid.). Veryzer et al. (1998) argues that the development process for radical innovations benefits if “being more exploratory and less customer driven” (pp. 318) compared to more incremental innovations which can benefit from more formal processes. One of the main challenges for practitioners is therefore to define a FEI process appropriately structured to allow assessment, improvement and governance while at the same time be flexible enough to leverage the creativity and dynamics needed to create novel and radical innovations (Riel, Neumann & Tichkiewitch, 2013).

Given the definition by Koen et al. (2001) and Stevens (2014) that the FEI is the activities before and idea is turned into an actual project it exists a variety proposed activities and phases that should be included in the FEI brought up by different researchers. Koen et al. (2001) suggest that there are four main activities involved in the whole process, namely; Opportunity identification, Opportunity analysis, Idea genesis and, Idea selection. Veryzer (1998) structures the process into; Strategy planning, Concept generation and, Pre-technical evaluation. According to Holahan et al. (2014) most researchers agree that the innovation and product development process can be distinguished by the following phases; Strategy-setting, Idea generation and, Idea screening/testing. Whereas, Riel, Neumann and Tichkiewitch (2013) means the FEI is composed of the idea generation and, idea selection. Despite the differences in the proposed names for the various activities and/or phases in the FEI there is a significant overlap between all these frameworks. The main take-away from all proposed frameworks is that they all share two main activities, one where ideas are generated and, one where ideas are selected. Hence, this study will structure the theoretical framework according to these two activities.

### 3.2.1 Idea generation

In the idea generation phase, structures, methodologies, tools and strategies are implemented in the generation of novel ideas with the aim of creating a new product, process or service. Koen et al. (2001) distinguish between two ways ideas can be generated. First, an idea can be generated based on the identification of an opportunity. This opportunity can be an answer to a competitor move, a newly discovered customer need or a technological breakthrough opening up for new business opportunities. Subsequently, an analysis of the opportunity is conducted to determine if the opportunity is worth pursuing in terms of strategic fit, brand value and profitability. The second way of generating ideas according to Koen et al. (2001) is a more opportunistic approach, i.e. ideas generated not explicitly based on an identified opportunity.

Any new product, service or process innovation has its starting point as a novel idea (Boeddrich, 2004). Consequently, according to Hansen and Andreasen (2005) idea generation can be seen as the source and carrier of innovation. According to Hedlund and Johansson (2010) there are differences in the idea generation for incremental, discontinuous and radical innovation. Due to this, the firm’s strategy must be considered when structuring the idea generation phase as it will have an impact on what ideas are generated (Hedlund & Johansson, 2010). Since there is a need for focus on both exploring new opportunities and exploiting existing there is a challenge for organisations to stimulate both the generation of radical and incremental ideas in the same setting (Reid & Bretani, 2004). Rather than stimulating incremental and radical idea generation



side by side, Magnusson and Martini (2008) suggest that organisations should keep those two activities separated.

Ideas for incremental innovations tends to be generated top-down while ideas for discontinuous and radical innovations often are generated bottom-up through customer interaction and/or technology development (Reid & Bretani, 2004). Likewise, Koen et al. (2001) states that involving customer as well as external partners increases the chance of creating new and valuable ideas. Moreover, involving customer and external partners can enable the firm to retrieve information, knowledge and competencies not existing in the focal firm and thus, reduce the “fuzziness” in the FEI, i.e. reducing the level of uncertainty, equivocality and complexity (Frishammar et al., 2011; Stevens, 2014). According to a study by Holahan et al. (2014) it was found most ideas for radical innovations came from formal ideation activities, i.e. brainstorming, customer observations, skunkworks, competitor analysis. Whereas, ideas for incremental innovations mainly came from informal ideation activities, e.g. ideas generated randomly by individuals.

### 3.2.2 Idea selection

After ideas have been generated, normally an evaluation and finally a selection is made. According to Cooper, Edgett and Kleinschmidt (1997) the idea selection is when the available concepts are evaluated and screened to enable selection of the most potential ones. At the product level, idea selection refers to the decision managers must take on which ideas to invest in and which to terminate (Calantone, Di Benedetto & Schmidt, 1999). As previously mentioned, there is an ongoing debate in the research community whether to have a formalized evaluation and selection process in the FEI or not. When it comes to idea selection, some researchers argue that there is a need to have a formalized process to be able to compare ideas and concepts and to better integrate the R&D with the overall strategy of the organisation to stimulate business and customer-oriented projects (Martinsuo & Poskela, 2011; Hall & Nauda, 1990). The importance of having the idea selection aligned with the overall strategy are also stressed by Cooper et al. (1997) and Martinsuo and Poskela (2011). By contrast, Koen et al. (2002) and Nobelius & Trygg (2002) argues for a less formalized evaluation and selection in the FEI since there is a risk that a too formulized evaluation process can harm the creativity and reduce the generation of radical ideas.

The available methods and tools organizations can use to evaluate ideas range from less structured methods, such as question lists and management committee discussions, to more structured methods such as structured scoring model, computer based expert systems and mathematical models (Martinsuo & Poskela, 2011). According to Carbonell-Foulquie et al. (2004) and Hart et al. (2003) the idea selection often includes a set of criteria which are used to assess and compare the ideas and concepts. These are often related to aspects of strategy, resources, markets, technology and risks. Martinsuo and Poskela (2011) proposes that organizations should focus on three criteria namely; market, technical and strategic. Market criteria refers to the extent which the idea fulfil customer needs and the market potential whereas the technical criteria refer to the possibility or feasibility of manufacturing/development. Finally, the strategic criteria refer to the need of having ideas and concepts aligned with the overall strategy. Unlike Martinsuo and Poskela (2011) proposed criteria, Carbonel-Foulquie et al. (2004) suggest having a separate financial criterion evaluating the probability and potential of financial success. However, Carbonel-Foulquie et al. (2004) argue that there is a need for further research on the relationship between the choice of evaluation criteria and a success variable (ibid.).

To enable a comprehensive assessment and comparison between ideas and concepts Corbonell-Foulquie et al. (2004) means that organizations can benefit by combining both qualitative and quantitative measurement when comparing and evaluating these since the combination of methods will result in a more comprehensive assessment. Compared to the later stages of product development the FEI evaluation usually focuses of criteria related to market potential, technical feasibility, product/service distinctiveness and customer acceptance (Carbonell-Foulquie et al., 2004). Regardless of which criterion and evaluation method organizations uses, it is important to realize that there exist no “best-practice” when it comes to evaluation methods. For this reason, organizations should establish methods and criterions that is suitable for their organizational circumstances (Martinsuo & Poskela, 2011). Equally important is it to have the evaluation process accepted by the organization and its employees (Kleinschmidt et al., 2007).

### 3.2.3 Development and commercialization

Even though development and commercialization are not part of the FEI, a description of this phase is given to provide the reader a full picture and understanding of the subsequent phases after the FEI. As previously mentioned, it exists a variety of proposed names for the activities initiated after the FEI. Koen et al. (2001) named these activities technology development whereas Veryzer (1998) named it technical development, commercialization and post launch and Riel et al. (2013) named it new product development and commercialization. In this thesis we define these activities as Development and Commercialization. Despite the different names of the proposed activities they all highlight the same characteristics. The output of the FEI is an idea or concept which has been selected for further development based on fulfilment of one or several criterias (Wheelwright & Clark, 1992). The output of the FEI can therefore be seen as the input of development and commercialization activities (Koen et al., 2001). It is in the development and commercialization activity that a product/process concept is developed into a finished product ready for commercialization.

Unlike the FEI the development and commercialization activities are more formalized and specific according to Kurkkio (2010) and the overall nature of work is more structured and goal oriented (Kim & Wilemon, 2002). Additionally, the activities in the FEI is often performed by one or a few individuals with small or non-existing budget unlike the in the development and commercialization activities where the activities often involve a larger cross-functional team with a larger and budgeted funding (Kim & Wilemon, 2002). The management methods performed in the FEI can be described as more unstructured and experimental unlike the more systematic in the development and commercialization activity. A common management method applied in the development and commercialization activity is the stage-gate model (Kurkkio, 2010; Wheelwright & Clark, 1992; Kim & Wilemon, 2002). The purpose of the stage-gate model method is to ensure that each ongoing project meet pre-defined criteria and therefore act as quality checkpoints for the ongoing projects. Consequently, each project must meet and fulfil certain criteria at each gate in order for the project to move into the next phase. The number of gates in the stage-gate method and the characteristics of the criteria can be of very different nature depending on the organization it is applied in (Veryzer, 1998; Wheelwright & Clark, 1992). The development of the products or processes are often run as projects with a project leader responsible for the cross-functional interactions (Wheelwright & Clark, 1992).

## 3.3 SUCCESS FACTORS IN THE FRONT END OF INNOVATION

Capability based theory describes what structural capabilities organizations need to have in place in order to be successful with innovation, i.e. how to effectively and efficiently identify opportunities and develop them into successful innovations. Multiple previous researcher has

tried to explicitly identify and address the capabilities needed for innovation, where Christensen (1997) and O'Connor (2008) focuses on innovation in general whereas Riel, Neumann and Tichkiewitch (2013), Floren et al. (2017) and Wycoff (2003) focuses on the FEI. According to Christensen (1997), organizational capabilities can be divided into three blocks namely; resources, processes and values. Resources refers to not only monetary resources, but also resources in term of people, equipment, information etc. Processes are according to Christensen (1997) defined as the activities used to transform inputs of any kind into outputs of higher value, whereas values refer to the criteria and/or the mindsets used for the decisions. Different from Christensen (1997), O'Connor (2008) takes a more holistic view and divides the needed capabilities into seven elements: organizational structure, mechanism for interfacing with the mainstream organization, exploratory processes, skills and talent development, governance and decision-making mechanism, and culture and leadership. In the studies by Riel, Neumann and Tichkiewitch (2013), Floren et al. (2017) and, Wycoff (2003) key success factors in the FEI are identified. These success factors stress the importance of having management support together with a clearly defined focus and process to increase the effectiveness in the FEI. Additionally, the importance of involving the entire organization and having a creative culture and encouraging employees to generate ideas. Floren et al. (2017) and Wycoff (2003) especially stresses the need for alignment between company strategy and the FEI. Unlike Riel, Neumann and Tichkiwitch (2013) and Floren et al. (2017), Wycoff (2003) also brings up the importance of training and coaching of employees to increase their competence in the FEI. In an attempt to create a combined framework derived from previous studies (Christensen, 1997; O'Connor, 2008; Riel, Neumann & Tichkiewitch, 2013; Floren et al., 2017; Wycoff, 2003), five key organizational success factors needed to support, and drive innovation have been identified by the authors, namely: Management support, Creative culture, Company-wide contribution, Defined focus and Understandable process.

### 3.3.1 Management support

Top management support and commitment has a central role in creating the capabilities needed in organizations for innovation since they will influence what type of achievements and behaviours that are recognized and encouraged (Boeddrich, 2004). Additionally, the top management has the responsibility to support and ensure that creative work, ideas and risk-taking is encouraged and valued within the organization. According to Amabile (1997) should mistakes and failures not be feared since it will reduce the risk-taking needed to work with innovation and to generate novel ideas. Since the FEI is characterized as highly uncertain, risk-taking is needed. Consequently, management must enable the organization to not fear risk-taking (Amabile, 1997; Stevens, 2014). Equally important is it that management foster a creative culture by showing enthusiastic support and providing feedback instead of directive supervision (Wycoff, 2003).

One of the purposes and responsibilities of top management is to direct resources and attention of the organization into areas which are strategically important (Van de Ven, 1986). This direction of resources, attention and funding can according to Kim and Wilemon (2002) send signals to the employees what they should focus their time and energy on. Equally important is it for management to understand that building organizational capabilities for innovation is no quick fix, it requires time, expertise and funds (Amabile, 1997; Wycoff, 2003). When it comes to the funding of innovation efforts and initiatives a trade of between creativity and governance must be made. The trade-off lies whether the funds should be earmarked to specific ideas and concepts to enhance management control or if the funds should partly be unspecified, i.e. used

for experimental efforts. Wycoff (2003) states that it can be beneficial to provide employees the resources to reflect and explore ideas in an informal manner. The efforts and support made by management together with increased cross-functional collaboration and clear innovation process has the potential to change the focus of the organization from routine to a more creative and innovative oriented organization (Van De Ven, 1986).

Despite the importance of management support and commitment in the FEI it is often neglected because managers tend to focus more on the later stages of innovation where the processes and procedures are more clearly defined, and roles and responsibilities are clear and well documented. This is done despite knowing that there is huge potential to leverage the potential of innovation in the early stages (Gassmann & Schweitzer, 2014). This statement is supported by Smith and Reinertsen (1991) who means that the FEI is often overlooked with regards to top management support, attention and resources due to the vague objectives and lack of traditional project management focus and methodologies unlike the later stages of innovation. Consequently, the FEI efforts are not given the attention it needs despite managers knowing there is substantial potential to leverage the potential in the early stages of innovation. Several researchers state that there are multiple benefits associated with an increased focus on the early stages of innovation. Nobelius and Trygg (2002. pp. 1) states that the “largest potential for improvement at the least effort possible” can be made in the FEI. A similar statement is brought up by Riel, Neumann and Tichkiewitch (2013) who means that the outcome of the innovation process, e.g. the actual innovation, the costs, time and needed resources, is to a very large extent determined by the management and its decisions made in the FEI. Consequently, the ideas generated must be of high quality and the evaluation method used to select the ideas to further develop must be effective to choose the “right” ideas.

### 3.3.2 Creativity and corporate culture

Since creativity is the source of innovation it is important to foster a creative culture to enable the generation of new and novel ideas, which if further developed has the potential to become technical and commercial successful (Ahmed, 1998). Since the work and social environment is correlated with the level of creativity it is increasingly important for organizations to foster a culture that supports creativity and enhances the organization's capability to generate both quality and quantity of ideas (Amabile, 1997; Ahmed, 1998; Riel et al., 2013). Creativity consist of three elements according to Amabile (1997) namely; expertise, creative-thinking skills and intrinsic motivation. Expertise refers to whether employees within the firm have the required knowledge and skills for a specific task. Creative-thinking skills refers to the application of creativity and cognitive strategies and methods attained through training. The last element is intrinsic motivation and refers to the extent of which employees within a firm “feel motivated primarily by the interest, satisfaction, and challenge of the work itself – and not by external pressure” (Amabile, 1997, pp. 3).

Consequently, it is important for management to create and foster a creative culture and atmosphere within the firm to encourage sharing of knowledge and ideas which are crucial to find and generate new creative combinations of information and knowledge. Additionally, employees should be stimulated and motivated to cooperate, challenge and build upon other ideas, and work cross functionally with colleagues from other departments and with other competencies (Amabile, 1997). If management would fail to creative a supportive culture for creativity, there is a high probability that it will have a negative effect on innovation. Destructive criticism and unsupportive culture will reduce employees from taking risks since mistakes will not be evaluated in a neutral manner and will therefore not be opportunities for learning (Hedlund & Johansson, 2010). The importance of a corporate culture supporting

creativity is supported by Koen et al. (2001) who means that the leadership and cultural factors within an organization has a high correlation with the innovation performance of the organization. Additionally, it is according to Wycoff (2003) important for organizations to provide the employees with sufficient training on how to participate in innovation teams and implement an idea management system allowing the organization to efficiently capture and store ideas.

### 3.3.3 Company-wide contribution

The responsibility of an organization's efforts to generate new creative ideas is not the responsibility of any single department. Instead should the responsibility to drive innovation be shared with all departments and functions within an organization. Additionally, it is according to Riel et al. (2013) beneficial to integrate external stakeholders in the work with innovation. By involving customers and other external stakeholders in the FEI the focal firm can generate valuable insights and access new and novel knowledge not existing within the firm. Additionally, it is evident that organizations encourage employees to work cross-functionally and interacting across functional boundaries not only generate more ideas but also build larger personal networks and can increase the quality of the ideas (Amabile, 1997; Wycoff, 2003; Björk & Magnusson, 2009). By promoting and encouraging formal interactions and forums where employees can share experience and information, organizations can stimulate cross-functional cooperation and interaction needed for innovation. Additionally, it is according to Björk and Magnusson (2009) important to have a systematic approach to improve the systems existing in organizations to share and store information and knowledge, e.g. knowledge management systems.

Since the ideation process needs to be seamlessly integrated into the later, and more formalized stage-gate processes it is important to design and structure the process, so it reduces the need for additional efforts and to make the ideas adoptable by other departments involved in the development (Riel et al., 2013; Koen et al., 2001). Consequently, it is important to engage business unit managers in the FEI since they are the ones who will take on ownership of the idea and devote scarce resources of capital, time and manpower to the development of it. In the event that business unit managers do not fully buy into and show commitment to the idea, it rarely becomes successful (Wycoff, 2003).

### 3.3.4 Defined focus

Developing and implementing an innovation strategy should be all companies' first step to manage innovation. This strategy should be based on a market assessment of the current trends in an organization's industry. The organization should then identify how these trends drive the need for innovation within the organization's industry (Goffin & Mitchell, 2016). Rafinejad (2007) and Koen et al. (2001) states the importance of having the innovation process at the front-end aligned with the business strategy to ensure a "uninterrupted, flowing pipeline of new products and process with value to the corporation" (pp. 49). The importance of alignment is also stressed by Reid and Brentani (2004) who means that the strategy should act as a guide for the focal company in the following phases and aid companies in the decision making on which ideas and/or projects to prioritize and which not to. According to Strecker (2017) there are six dimensions organizations need consider when defining an innovation strategy. The first dimension, *innovativeness* refers to *the* degree of newness in a product or service. Innovativeness is measured along two sub dimensions, market innovativeness and technology innovativeness. Market innovativeness includes aspects of newness from a market perspective, e.g. if a new product or service meets new customer needs or change customer behavior. Technology innovativeness refers to the degree of innovativeness from a technology perspective, e.g. if the new product or service is completely new or based upon an existing

technology. The second dimension, *distance to core business*, refers to the newness from a firm perspective. This dimension includes aspects such as to which distance from the core business and competence a firm should seek and develop innovations. The third dimension, *driver of innovation*, refers to which 'force' an organization chose to drive its innovation, i.e. if the drive of innovation originates from customer demands (market orientation), technology advances (technology orientation), and/or competitor actions (competitive response). The fourth dimension, *innovation field orientation*, describes which fields or areas an organization focuses its innovation efforts. These fields or areas can be a customer group or need, a technology or competence within the firm. The fifth dimension, *timing of market entry*, refers to whether the ambition of the organization is to be a first mover with the introduction of new innovations or not. The sixth and final dimension, *source of innovation*, refers to whether the firm has an ambition to invent inhouse, use external sources or a mix of both.

The management must communicate the strategy and its role for the company (Goffin & Mitchell, 2016) and it must be emphasized throughout the organization, at every level and department (Merchant & Van der Stede, 2012). In a study by Holahan et al. (2014) the need for a guiding strategy is supported. The strategy should be used to define long-term goals such as sales, profits and growth generated from new products. Additionally, it is important to distinguish if the ultimate goal is to generate technological advances (technology driven) and/or customer benefit (customer driven). Where the technology-driven view focuses more on technological novelty and advancement and the customer-driven focuses more on creating customer value and commercial opportunities (ibid.).

Although, many researchers agree on the importance of a guiding innovation strategy (Goffin & Mitchell, 2016; Rafinejad, 2007; Koen et al., 2001; Reid & Brentani, 2004) many companies do not have a clear strategy for innovation. Developing a strategy and involve the entire organization is a great challenge according to Riel, Neumann and Tichkiwitch (2013). The consequences of not having a clear strategy which guides organizations in their prioritization and decision making is an increased risk of making the decisions made in the FEI ineffective, e.g. to make decisions on project specific criteria without considering their strategic fit (Khurana & Rosenthal, 1997).

Most organizations have scarce resources, and this is especially true for the R&D organizations where the resources should be utilized in the most effective and efficient way. Consequently, it is important for organizations to have a structure in place to guide the decision making on which ideas to prioritize and select and which not to (Reid & Brentani, 2004). In the same manner, Wycoff (2003) and Riel et al. (2013) argues for the need of focusing the creativity within the scope of an organizational strategy. The strategy should contribute to innovation by aiding the employees and external stakeholders to focus their experience and creativity in areas decided by the corporate strategy (Riel et al., 2013) and consequently enable the employees to identify and select ideas relevant to the firm in the FEI (Koen et al., 2001). However, this strategy should be defined narrow enough to focus on the company's core competencies, but also broad enough to tolerate for exploration into related areas (Wycoff, 2003).

### 3.3.5 Understandable process

Working with innovation in the FEI requires organizations to have a systematic approach and understandable process to channel the focus and effort into relevant areas. The process should be documented and communicated throughout the organization to make sure that all employees understand the process, its purpose, and its linkage to the overall corporate strategy (Riel et al., 2013). In the same manner Wycoff (2003) states that it is important that the employees of the

organization understand their role in it. This is due to the increasing complexity with growing amount of resources and people involved as the process progress, making it increasingly difficult for employees to monitor and understand what is happening with their idea (Van de Ven, 1986). Additionally, should metrics and criteria used to screen, evaluate and select ideas be developed in advance, allowing employees to know beforehand under which criteria's their ideas will be evaluated and selected upon (Wycoff, 2003).

The idea generation and idea selection phase should be clear and transparent enough for employees, so it aids them in the process of exploring for new opportunities and inspiration in the surrounding environment (Boeddrich, 2004; Wycoff, 2003). Consequently, it is important for management to give feedback and team communication to the employees and thus providing them insight on the subsequent steps in the process allowing the employees to follow the progress of the ongoing ideas and/or projects under development. According to Amabile (1997) this is important because it can stimulate creativity and enhance the intrinsic motivation of the employees because they are kept informed and updated on the progress of the ideas. Although, there is a need for a clear and understandable process, it is according to Wycoff (2003) important to keep in mind that a too structured process can have a negative influence on the creativity of the organization and consequently the innovation performance of the focal organization (Amabile, 1997).

## 4 RESULT

The following chapter will describe the case study's result which is the current situation at Alpha. The structure of this chapter is recognizable from the structure of the theoretical framework. The first part will include a description of their current innovation process, from idea generation to idea selection. The second part will present the findings related to the identified key success factors presented in the theoretical framework. All information presented in this chapter has been obtained through meetings, interviews, dialogues and/or observations.

### 4.1 ALPHA'S CURRENT PROCESS

The process of developing ideas into finished products follows a five-phase process at Alpha, namely: *discover*, *define*, *design*, *develop*, and *deliver* as seen in figure 2. Each of the phases are separated by a gate where a decision is taken whether to continue the development of the idea/concept/project or not. In the first phase, *discover*, ideas are generated and made into a business case for review. If the idea is approved it moves into the second phase, *define*, where the ideas are made more explicit with activities such as resource-, budget- and project planning. If the idea is approved in the *define* phase it is made into a project and moved to the subsequent stage *design*. In the last three phases, *design*, *develop*, and *deliver*, the project is tested, validated and developed into a finished product or service before implemented and delivered into the organization. Since the focus of this thesis is the front end of innovation, i.e. the stages before an idea becomes a project, the first two phases, *discover* and *define*, will be the focus of this section.

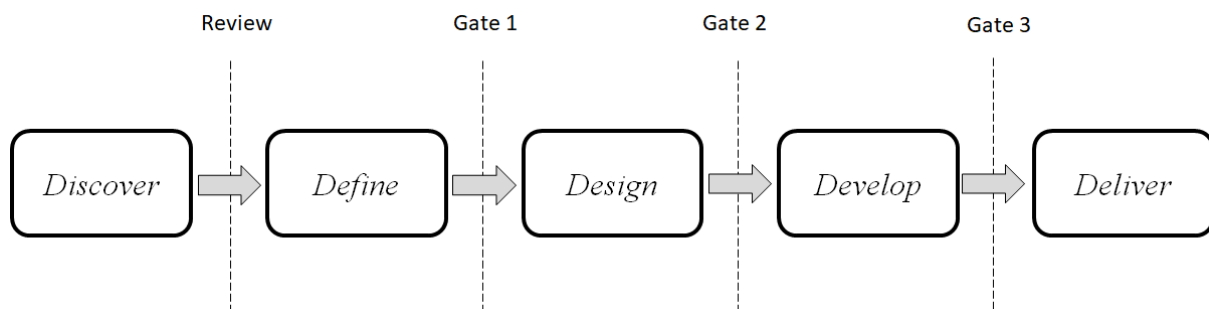


Figure 2: Schematic picture of the *discover*, *define*, *design*, *develop* & *deliver* phases at Alpha.

#### 4.1.1 Discover phase

As previously mentioned, ideas are generated in the *discover* phase. There are two ways an idea can be generated at Alpha. First, an idea can be created based on an identified need from the organization or market. At Alpha this identified need is often related to their core business idea to develop new solutions in their industry. These ideas are mostly generated and ran by the line functions at Alpha. The second way an idea can be generated is when a single or group of employees comes up with an idea in a more opportunistic manner, i.e. an idea generated not explicitly based on an identified customer/market need.

The generated ideas at Alpha does not follow the same process in the *discover* phase. It exists three streams from which ideas are developed, as seen in figure 3. The first stream *Infrastructure* refers to ideas needed to secure that Alpha *can* sell and *how* Alpha sell, e.g. a payment system for their subscription. Ideas in this stream are mostly run in the line functions.



When *infrastructure* ideas are generated, they must first be approved by the line manager before they are reviewed by the Project office [PO], a separate department responsible to ensure strategic alignment and, track and monitor the progress of the ongoing development of ideas and projects. During the Project office review the ideas are reviewed for strategic and portfolio alignment. The Project office review marks the end of the *discover* phase. During the *discover* phase this stream is governed by the Project office. The second stream *Offers* refers to ideas for stand-alone products and services, e.g. concept of something to sell. Unlike the *infrastructure* stream which secure that Alpha *can* sell and *how* it sells, the *offer* stream secures what to sell. After an idea has been generated it is reviewed by the offer team to ensure strategic fit and potential. If the idea is approved by the offer team the next step in the stream is to get approval from the Portfolio Board. The Portfolio board is, unlike the Project office, not a separate department but instead a monthly meeting forum with senior executives as participants. As can be seen in figure 3. the review at Portfolio board marks the end of the *discover* phase.

The third, and final, stream is the *Out-of-the-ordinary* ideas which are managed by the innovation department (figure 3). The ideas generated in this stream are deemed too “crazy” to be managed by the line functions hence the placement at the innovation department. The ideas in this stream comes from employees at the innovation department themselves, from employees at other departments or from external individuals. The purpose of this stream and its management by the innovation department is to utilize the creativity of every employee and outside individuals to create new and novel ideas. Ideas generated internally or externally in this stream are submitted into an online idea database, which is governed by the innovation department, where every employee can vote for which idea, he/she want to be commercialized. The purpose of inviting external individuals and potential partner companies to the platform is to tap into the creativity from the outside world and build a community around the brand and enable an easy way for employees and others to submit ideas of their own. The online idea database is screened by the employees from the innovation department and a selection is made on which idea/ideas are chosen to be brought up at the management review which acts as the final step in the *discover* phase. The selection of which ideas to move forward is done mainly subjectively, i.e. without any formal decision criteria. During the screening and subsequent selection of ideas an internally developed framework has been developed to aid the process by filtering out the most potential ideas.

When an idea has been selected, the innovation department gives support to the ideator to create a pitch and concept to use at a management review, in which vice presidents [VPs] from all line functions are present. The purpose of having a management review is to involve senior management in the early stages of innovation and enable employees and ideators to gain support for their ideas from senior management in a relaxed environment. When the pitch has been given the VPs vote whether to approve the idea or not. If the idea is approved, resources in terms of time and manpower is given to further develop the idea in the subsequent *define* phase. However, if the idea is defined as an *offer* it is transferred to the Portfolio board pitch after approval at the management review. Two factors that influence whether or not the idea is to be transferred, to the Portfolio board, is the level of cross-functionality needed for the development of the idea and the level “out-of-the-ordinary” the idea is. If both these factors are low the idea will be transferred to the Portfolio board, as seen in figure 3, after an approval at the management review. As previously mentioned, the ideas generated in the *out-of-the-ordinary* stream can origin from employees at the innovation department themselves, employees at other departments or from external partners. Therefore, the responsibility for the innovation department is to develop or co-develop the ideas with the ideator/partner and at a later stage in the development process ensure a transition of ownership to the line organization.

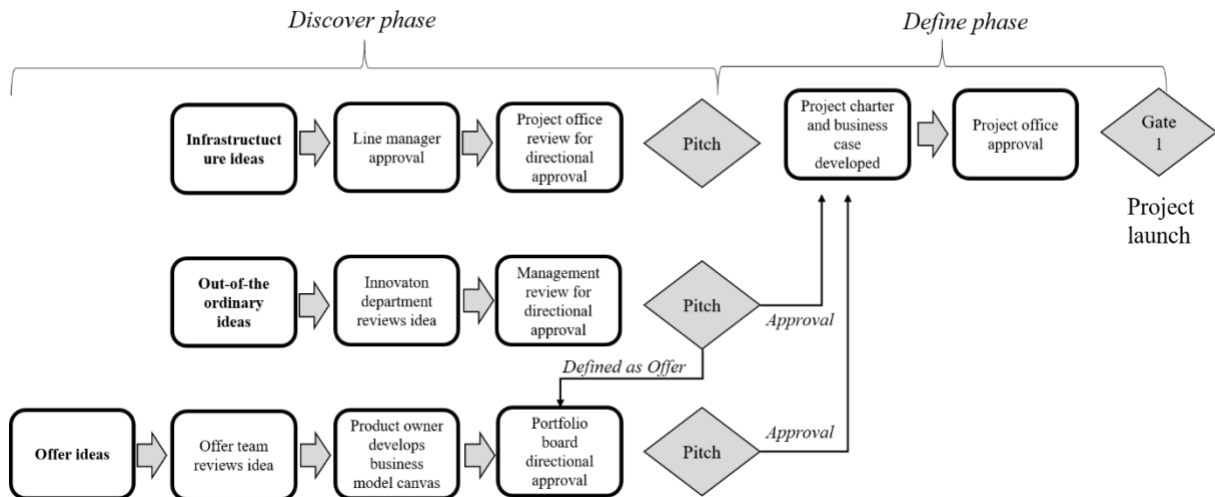


Figure 3: Overview of the FEI process at Alpha.

Key activities in the *discover* phase includes a market and customer needs analysis to generate insights if there is potential in the idea. Depending on the type of project there are different deliverables required in the final review in the *discover* phase. For the *infrastructure* stream, the key deliverable is a project charter describing the business objectives, purpose, resources needed, customer benefits and core team needed to develop the idea. For the *Offer* and *Out-of-the-ordinary* idea streams the key deliverable is a business model canvas stating the resources needed, the target customers, the value proposition, and potential revenue and costs structures. Additionally, a financial analysis developed together with a controller is required in all streams to identify the financial impact the idea have on the business. These key activities also act as the gate criterias since they must be presented and approved at each respective management review. The financial process for budget release runs in parallel with the idea approval process seen in figure 3. The budget release process is initiated in the *discover* phase when a business controller is involved in the creation of the business case. If the idea or concept is approved in the *discover*, and subsequent *define* phase, i.e. approved at gate 1, it becomes a formal project and a budget is allocated for it.

#### 4.1.2 Define phase

When ideas from the three streams are approved in their respective pitch the *discover* phase is ended and the *define* phase begins. During the course of this thesis, the process has been changed from having two separate streams in the *define* phase, one governed by Project office and one by Portfolio board to having one merged stream. The purpose of having two streams was to separate the *offer* and *infrastructure* stream in order to enabling an easier overview, governance and tracking of the ideas/concepts. The Portfolio board had the responsibility for the *offer* stream and was a monthly meeting forum consisting of the top management and VPs. Unlike the Portfolio board, the Project office is a separate department which has responsibility for the *infrastructure* stream. The purpose of merging the two streams into one was done in an effort to simplify the process, allow for better prioritization of the ongoing ideas, concepts or projects, and to deal with dependencies in a better way. The overall responsibility of the Project office is to ensure strategic alignment and execution of activities throughout the entire development process i.e. moving an idea to a finished product. This is done by evaluating ideas for strategic fit, planning of resources and continuously measuring and monitoring the progress of the ideas/concepts and later projects.

Key deliverables, or gate criterias, in the *define* phase is resource and budget planning for all subsequent phases to ensure that key activities are planned for and sufficient resources are available. Critical dependencies and risks in other projects are mapped out and, reviewed and agreed with relevant stakeholders together with a legal check for the idea/concept. Additionally, a detailed business case and project charter must be presented where the objectives and customer values of the proposed idea be clear and well formulated. If external resources are required to further develop the idea/concept a supplier should be identified for the subsequent design phase. Unlike the discover phase, all projects independent of type has the same deliverables required for approval in the define phase. All these deliverables must then be presented to the Project office board for review.

As seen in figure 3, an idea/concept exits the *define* phase if an approval from the Project office board is attained at the first gate, at this stage the project is either assigned to a Project office program or defined as a stand-alone project. Additionally, if an idea/concept is approved at the first gate, it becomes a formal project and a budget is allocated for it. In the subsequent phases, which will not be in focus of this thesis, more explicit development activities take place. Concepts or prototypes is created for the projects to review, validate and test it before further investments are made. Development of systems and processes are also made to enable the project to be operational in the receiving organization before a complete commercialization can be done.

## 4.2 SUCCESS FACTORS FROM LITERATURE APPLIED TO ALPHA

*This part will present the findings related to the identified key success factors presented in the theoretical framework.*

### 4.2.1 Management support

Throughout the empirical data, it became evident that Alpha's top management are ambitious in supporting an innovative atmosphere, which was highlighted by executive 1:

*“At Alpha we are not doing things the usual way and we are setting up a different mindset. We want employees to think differently and we want employees to actually work on their ideas. It impossible for us [top management] to come up with all innovative ideas, it should come from within the organization and that is something we encourage”.*

This was also observed at the headquarters, where top management acts as role models and leads the way by setting an example for employees to follow. The top management clearly encourages creative work, ideas and risk-taking with enthusiastic support to move away from a traditional direct supervision. This was consistently supported by employees throughout the interviews:

*“I have always felt that management has been supportive when it comes to innovation. Very good culture in this matter” - employee 2*

*“Creativity and innovation are supported - broadly yes. (...) I don't have a problem to just do things [to not follow explicit processes]. Having the freedom and support from management to go around that is good, you are allowed to do that. The spirit and attitude is really there” - employee 5*

*“We also have a lot of support from the management team when it comes to innovation. Innovation is something we should continue to do, protect, put time and effort into. Which is why we [Innovation department] continue to exist” - employee 1*

The interviewees claim that there is a culture of not being afraid to fail or make mistakes at Alpha, where management is establishing an open environment where risk-taking is valued and hence, it's ok to “fail”:

*“Generally, in Sweden, it's somewhat considered “inappropriate” to fail. It is almost like a ‘don't fail policy’. We [Alpha] are doing it differently; try, fail, retry...” - employee 4*

The management of Alpha wants to ensure that all employees can blossom and truly demonstrate their creative capabilities, which goes in line with an open environment where *“processes are developed to enable employees, not hinder”* as stated by manager 3. However, ideas or projects can sometimes be killed immediately, which can come across as harsh. With this in mind, it becomes interesting when the data clearly indicates that there are lacking mechanisms for feedback, to establish a learning climate. At the moment, it's up to every employee to give or receive feedback and there are no set procedures:

*“No process [for feedback], so no formal way of doing that in the organization. And I think it's actually something we could benefit from having, to learn and incorporate feedback from previous projects. (...) we have been doing it just informal and been talking to each other after the projects, but it's not enough. Most projects haven't finished in that way [many projects still ongoing]. Projects have been killed but it has been quite specific reasons why it's been killed. So, yeah, we don't do much of what we can do better in terms of feedback” - employee 1*

Given the situation with no feedback, there are still conversations about what could be improved. However, as expressed by employee 2 *“If you are proactive, you ask for feedback. It lies within the culture”* indicating that if you want to improve, you just have to ask. To even challenge employees further to question the conventional, think broader and foster innovativeness the organizational harmonize around the question ‘Why?’. This was highlighted by manager 1:

*“To question our ideas, we have actually employed five people. They are here to provoke and critically challenge ideas from the organization”*

Alpha's management, which supports an open environment with non-hierarchical structures to enhance creativity and innovation, still face challenges. The complexity of building a company in parallel with going away from the roots of a traditional hierarchical car manufacturer. These concerns have explicitly been expressed by employees where they feel the support from management to be innovative, but there is a lack of underlying structures and processes since Alpha is still in a massive phase of expansion. On the question regarding if the management supports creativity and innovation, manager 2 answered:

*“It's [the support] something that is there, you can almost feel it. Sadly, on a scale from 1-5, I would say that we have 2. Alpha really wants this and has ambitions, even the CEO is clear on this, but we have no processes and structures to support it. Alpha must create fundamental conditions for being able to work with innovation throughout the whole organization”*

This statement goes in line with some other interviews from employees and observations. Even if the open environment with a strong supportive culture is evident, there is still a consistent battle of resources. For example, one interviewee expressed that he has ideas he would like to work with, but his day-to-day work occupies 100% of his time and there was no chance he could give up that at the moment, even if he would like to. Moreover, another interviewee (manager 5) expressed *“the top management needs to decide what our focus should be now and direct resources, at least some prioritizations, should it be to have everything in place or come up with even more ideas? - it's a bit chaotic at the moment”*. Similarly, interviewees have expressed solicitude towards budgeting which is related with the non-consistent focus and direction of resources. Some even stressed that it's unclear who actually takes over the responsibility of the funding when projects enter the project office.

*“Last year we had an approved budget, there is still quite a lot of process around of actually getting that money released, and in order to get it released, it needs to be re approved” - employee 1*

*“Today, we do not have an undefined budget post, all resources [i.e. money] is assigned to certain projects, only a very small amount is allocated to a “whatever-budget”. If money is needed, we can take from a project which spends less than planned and move them to another project” - manager 1*

All in all, Alpha's management have established a supportive working environment for creativeness and innovativeness. They put efforts into the influence of behaviors to the rest of the organizations, where novel ideas and risk-taking is encouraged. The management review, as presented in section 4.1, is a clear evidence of the enthusiastic support Alpha management shows to foster a creative culture. However, resources and attention have been directed to strategically important areas, but some prioritization or strategy is missing in the FEI and thus, a lot of projects is still ongoing or pending. Also, structures for budgeting and getting resources released is unclear. On the other hand, the management seems to be aware of the time and effort needed to build organizational capabilities for innovation.

#### 4.2.2 Creativity and corporate culture

Throughout the empirical data, and consistent with the majority of interviewees, employees perceive the creativity and corporate culture as amiable and open-minded. At Alpha, there is clearly an ambition among employees of doing “new things” and “things differently” with the need of captivating innovations. Not only have people been recruited for this reason, but it has also been successfully communicated through the organization by the CEO. This was apparent in the data and highlighted explicit of the majority:

*“What works well is the power of the organization, you really want it to work. All who are here are somewhat entrepreneurs and self-propelled with “180 degrees” of ideas” - manager 7*

*“...but a strength is the general kind of culture both on the ground with people and supporters that are enthusiastic and are willing to collaborate, share and be part of it. The climate is as it should be for a creative workplace - manager 6*

Generally, the strengths with Alpha in terms of corporate culture is that there is drive, ambition and commitment with an incredible energy in the organization to change things. This was also

observed by the authors, in combination with a strong loyalty and trust to the management. Much emphasis is placed on hiring “creative” individuals which has helped to build and foster a “start-up” culture and mentality at Alpha. Additionally, much effort is placed on diversity in terms of background, gender and age to create a creative setting. As two managers stressed:

*“It is always a balance with being too hip or conservative. We must be able to attract the right people, we all need types, but everyone does not fit in this environment. When I recruit for my team I am careful that the person “likes” changes, because it will happen all the time” - manager 6*

*“If you want to change something [the industry] completely, also get new people [i.e. people from another environment]” - manager 8*

In line with getting “new” people, executives have focused on recruiting talents outside of the automotive industry to move away from traditional processes within that industry which have been a key driver to generate ideas from “fresh minds” as explicitly expressed by manager 8. Interestingly, at some departments, the majority of employees are non-automotive and comes from other industry. Additionally, the average age at Alpha is below 40. Consequently, this has created a diverse workforce that foster in an ever-changing environment. In order to even further create a creative and innovative environment with an open-minded culture, Alpha have formed a setting where employees have the opportunity to meet and network, across hierarchies and departments. The top management have established informal workshops and forums, including the town hall meeting every month:

*“The town hall is a monthly “thing” in which employees can meet informally for 3 hours and share information, it's more a fun thing for everybody. During this time, we have quizzes, sharing activities and games etc. It is very appreciated. This is during work hours and does not even include all the after-work activities we also do” - manager 4*

Consequently, it is important to stress the management's efforts in establishing an informal, open-minded, social environment where employees can blossom with their creativity. Alpha really wants people to meet and share information and ideas, not only internal but also external to steer away from the conventional setting of traditional car manufacturers. This can also be seen through the internal idea platform in which employees can share ideas with the whole organization. On the other hand, this diverse workforce and the way of working have in some employees' views created an unstructured approach:

*“A weakness is that it is quite unstructured, it creates silos and people become extremely protective regarding certain parts such as ideas. It has gotten better but a lack of structure and a clear direction is absent. In time, this could become an even greater strength if fixed” - manager 3*

However, this competitive landscape with silos might be a consequence of the hefty expansion where employees express “nowadays we are under more pressure, people become competitive”. This also goes in line with views of management being more positive towards most ideas in the beginning for the sake of keeping a high morale but has now tighten up a bit according to an executive. However, throughout the interviews employees also expressed that this competitiveness has a positive side where undefined roles create friction amongst employees and departments, which in turn is proactive and contributes to innovation. With this in mind, employees have also pointed out that the “political game” is present every day, which

is an effect of the competitiveness and eager to get one's ideas through. For example, the management review is commonly referred to as a "necessary forum" to discuss wild ideas and to get approval from management because if those ideas go the normal way (through line function and/or PO), they would not stand a chance.

All in all, the diverse workforce in combination with the corporate culture is set to modify the way of thinking and provide Alpha with increased abilities to accomplish their vision. Alpha clearly foster a culture that supports creativity and enhances the capabilities to generate both quantity and quality of ideas. In addition, Alpha encourages employees to share knowledge and stimulate each other, both to cooperate and challenge. Interestingly, at Alpha, there are no set structures for rewards to employees and no training and development for employees in the FEI. Even though processes are seen as unstructured as an effect of the creative nature of the corporate culture, the data strongly indicates that employees still see the culture as something positive.

#### 4.2.3 Company-wide contribution

Alpha's management has set focus to involve the whole organization where the innovation department is supposed to facilitate this at all departments. However, the empirical data shows that there are mixed feelings of what the innovation department is, and what they actually should do. Some even expressed "*I don't believe in this concept, why do we even have them?*", whereas others saw the potential, but were unsure what they actually do since they work with more crazy and cool ideas. Some saw the innovation department as accelerators or incubators, and others saw the innovation department as the function that's solely responsible for innovation at Alpha. In this matter, managers were more united and expressed more concerns regarding innovation at other departments, and how the actual process for innovation should look like at the rest of the organization:

*"Innovation cannot only be done at the innovation department, it must be done throughout the company in different ways" - manager 2*

*"What we lack as a company is how we facilitate and ensure that innovation takes place elsewhere other than the innovation department" - manager 3*

So, according to employees, the advantage of the innovation department is that they can focus on innovation and take risks with "crazy ideas". The negative effect of this seems to be that the other departments believe that innovation is solely handled by the innovation department and is not their main responsibility, which is not in line with the management's vision of how Alpha should operate. As executive 1 stressed:

*"It doesn't matter where in the company you work, we are creative human beings and is supposed to come up with innovative ideas, it's part of the job and Alpha"*

Interestingly, executives and managers see the danger if the rest of the organization just release innovation matters to the innovation team. According to manager 6, it's important that the entire organization takes this on. If somebody in the line function "*finds something, it must come up*". Ze further stressed that employees cannot become comfortable and solely focus on their day-to-day work since Alpha are too small, it's everybody's responsibility. However, as mentioned before, the internal idea platform is a place where the whole organization can express and share ideas, both regarding internal services but also external offers which is "*a great way to involve the whole organization, it doesn't matter if the idea is "dumb" - it might be valuable*" according

to employee 5. This platform, which was developed by the innovation department, is also intended to get developed to external stakeholders. On the platform, employees vote on ideas that they consider important whereas the innovation department develops the most prominent ideas in collaboration with the original poster. To involve the organization even more, the innovation department has also established an evaluation framework shared across the organization in order to assess the potential of ideas. From here, the idea either gets killed or gets pitched in the management review, where its approved for further development. In addition, to be able to work on an idea outside of the day-to-day work, Alpha's management has taken a decision to change the HR department. According to manager 5, "*changing HR is crucial. The HR department needs to be extremely flexible, so employees can spend time on their own ideas*" implicating that employees should be able to shift assignments frictionless. However, according to the empirical data, this is not the case. Both the actual delivery of projects between gates and time allocated for own ideas is problematic, hence is stalling and creates confusion. This was clearly expressed by two interviewees:

*"Lately we have had pressure to realize projects more. The problem we encounter as a company is the implementation of projects. There is no one to take over the projects after the first gates, and they get stuck"* - employee 2

*"Actually, sometimes you don't even take on more things because you have so much else to do. (...) there are a lot of things I have not been able to run since there is no time and I know that it is some political game that needs to be done"* - employee 5

However, on the projects that actually are ongoing and are currently in later stages of the process, Alpha puts emphasis on cross-functional teams. Here Alpha promotes interactions and stimulates cross-functional cooperation as manager 5 described "*When we actually do run projects all the way, we often have a very diverse team with members from different departments*". In addition, from the interviews and observations, Alpha encourage cross-functional workshops involving all departments within the organization.

#### 4.2.4 Defined focus

While collecting empirical data it became evident that there is no defined focus in the FEI, or explicit innovation strategy, at Alpha since management does not want to limit themselves to a specific area. Instead Alpha wants to focus on "*disrupting the traditional automotive industry*" as manager 10 stated. This statement was supported by the majority of the interviewees who meant that the vision of the company, i.e. to transform the automotive industry, acted as a "guiding star" for the company. However, when asked whether a narrower focus was needed in the FEI the majority of the interviewees agreed that it would be beneficial to the company. Several managers and employees stated that a more defined focus would enable Alpha to better channelize their attention and resources and therefore increase the overall pace of development. The need for more focus was highlighted by employees and managers throughout the interviews:

*"There is not very much focus within the company. It is something that I would want more of. We are not many people, but we are working on so many things. Many involved but few who actually drives the ideas or projects"* – employee 3



*“It is a bit sad, Alpha started with a broad playing field, but we have not decided direction, we have not prioritized. We are 140 people running 70 different ideas. Simply put, where should the resources go?” – manager 7*

*“I think we need to be more focused. There needs to be a connection to the brand and what we got in the portfolio. Then we need to ask ourselves, what do we miss?” - manager 4*

The lack of focus was also observed at the headquarters where there were expressions about the lack of focus and how it affected the prioritization of the ongoing projects or ideas. During the time of this study, Alpha was in a situation where they were preparing for a hefty expansion. Consequently, the whole organization strived for commercializing their products and services but was held back by the lack of prioritization. As three interviewees stated:

*“We have ideas that no one take ownership for. It is no one that want to have it [the ownership]. Why? Because we have so much to do” – manager 3*

*“If you want speed, then you need everyone to run in the same direction. Today we run in different direction. Which direction should we go for...?” - manager 4*

*“There not very much focus within the company. It is something that I would want more of. We are not many people, but we are working on so many things. Many involved but few who actually drives the ideas or projects” – employee 3*

Interestingly, despite the three statements above stressing the downsides of lack of focus, there were, as previously mentioned, opinions from executives stating that Alpha should not limit themselves and focus on specific areas. Instead Alpha should focus on the overall strategy to transform the market. Even with the opinions from many interviewees that there is a lack of focus, most of the interviewees stated that the overall strategy acted as a guiding star to some extent. While most of the managers stated that a stronger focus is needed at Alpha, it must be done without suffocating innovation. When the interviewees were asked if there were any KPIs used to measure innovation in the FEI, it became evident that this was non-existent at Alpha. When this was found, additional questions were asked to identify the interviewees opinions whether KPIs in the FEI would be beneficial for the focus and overall work with innovation. Whereas some interviewees believed that KPIs could aid the work in the FEI by providing clearer overall direction for the organization others believed that it would only hinder the work - *“you cannot measure innovation”* as manager 2 expressed.

Throughout the empirical data, and consistent with the majority of the interviewees, it was found that there were some challenges associated with the available market intelligence. Whereas some of the interviewees expresses opinions that there was a lack of available market intelligence others meant that market intelligence was available but not used correctly. These two different views can be shown by these two statements:

*“We need more market research to steer the direction we want to go, in other words, which problems should we solve” - manager 2*

*“if we were to do more data driven ideation, it would also help us focus within Alpha and I think focus ideation would help us probably be better in the execution part as well” – employee 1*

Additionally, several of the interviewees expressed feelings that the current situation at Alpha, has made it difficult for the organization to look ahead. As stated by one employee:

*“I think that we [the innovation department] get pushed to focus on executing and delivering things for the near future rather than “what are the big trends 10 years out” which maybe is what we should be doing but, either way. We do not do that today” - employee 1*

The challenge of not having sufficient information about the market and customers is made more difficult by not having a product launched on the market. Without a product on the market there is, according to several managers and employees, a challenge in testing ideas and concepts and retrieving customer feedback. Consequently, it becomes difficult for the organization to solve problems based on actual customer needs. This goes in line with the interviews held at the innovation department where a majority means that there should be more data driven decisions in the FEI unlike from today where many ideas are generated in a opportunistic way, i.e. not based on data. As stated by two employees:

*“We should focus on problem-solving ideas. Look for trends and problems and then answer to them” – employee 2*

*“I think from what I’ve been looking at external processes or occasionally meeting other companies that work with innovation, is that I feel that we start with the idea, rather than the problem. I think it’s more common for other companies/teams etc to start with research and be more driven that way. Start with research and gather data, identify problem and from there, define a solution and start to work with that. Its more data driven and also it helps to ground the project in a context which I think help the projects to be successful since everyone is on board and knows the reason why we are doing it” – employee 1*

When asked whether a stronger focus is needed for the innovation department the majority expressed similar opinions as the managers, specifically that a stronger focus was needed. However, when asked detailed questions how explicit the focus should be, the answers from the innovation department differed. Whereas some argued for more wider focus, others meant a narrower focus was needed as illustrated by these three statements:

*“We [the innovation department] should not limit us too much. If we [in the early stage] have different parameters there would be a miss-match with the later stages” - manager 1*

*“I think we need a little bit of both. Better ideas if you go strategic. If you only go open, you will end up with anything. If you would have some sort of strategic direction, there would be more drive from the beginning. (...) at the innovation department we need to remain open, so we can find stuff that is a little bit “outside-of-the-box”” – employee 3*

*“We need to have focus. This would give a structure. The problem is not getting ideas. It is getting them done. Focused goals and have something to report back to. Then we can also test them, which we are currently not doing” - employee 5*

All in all, the majority of the managers and employees interviewed stressed that a stronger focus is needed at Alpha in general. There is a need to improve and increase the generation of market intelligence and use this data for more focused idea generation to solve problems for the customers. The lack of focus and prioritization has made selection of ideas in the FEI problematic since many ideas have been selected and turned into projects, but few have been progressing at the anticipated throughput in the development phases.

Despite these challenges’ Alpha faces, it is according to several interviewees, important to remember that Alpha is a very young company and that processes and structures within the organization are still under development. As previously described, the process and selection has been changed, and most of the interviewees believe that it will improve the prioritization and focus within Alpha. The lack of prioritization with the previous process and structure resulted, according to employee 4, in *“a pipeline of too many ongoing projects and ideas”* where the progress of development was negatively affected. As stated by manager 5, *“previously we have not had a broad picture about where our resources go to and where we focus our efforts”*. Additionally, it was found in the interviews that there were occasions where decisions were taken more than once as a consequence of the lack of prioritization. When asked what employees could expect with the new updated process and structure manager 5 stated:

*“We will know what we work with, we can prioritize, we will know which projects must be finished first”*

Consequently, the majority of the employees believes that Alpha will achieve a better understanding and prioritization of the ongoing projects with the updated process. Additionally, it is believed that it will become easier to channel resources for the most critical projects. However, the need for more focus in the FEI, i.e. before ideas are turned into projects, remains

#### 4.2.5 Understandable process

It was not found in the empirical data any shared opinion whether there is an understandable process or not at Alpha. Whereas the majority of the managers and employees meant that the process it not understandable some stated the opposite:

*“It [the process] is very clear. If we have an idea, then we know how the structure works” – manager 2*

*“We have a very good process which originated from the innovation department. Which we have adapted to be more generic, as well as fit more products and services and this new “updated” process is something that we work with” - manager 6*

These statements do not go in line with the majority of the interviewees who stated that there is a need to make the process more understandable. Opinions were expressed stating that there are no clear boundaries between the different process streams and the boundary between PO and PB can sometimes be confusing. Additionally, it could sometimes be difficult to keep track of the ongoing ideas or projects. As stated by one employee:

*“I think we have made it [the process] too complicated. We have had several different forums, often with overlapping responsibility” - manager 7*

Despite varying answers whether the process was easily understood or not, the answers if the process was followed was more consistent. The majority of the interviewees stated that the process was not always followed as it has been structured. Whereas some ideas followed the proposed process there has been several occasions where ideas have skipped steps in the process because “someone liked it”. As stated by two employees:

*“It is not a very clear process. During the stages of idea generation and then conceiving the process is somewhat followed at the moment, but there have been times when there have been shortcuts to the management review, while other follow the process” – employee 2*

*“Sometimes in the early stages we push ideas forward without a formal approval, at least in the early stages. In those early stages we can sometimes sidestep the process. But for existing projects in the later stages, this is not possible due to the need for resources and dependencies from other departments” – employee 3*

One of the main rationales for sidestepping the process was to keep up the pace of the development of the ideas or concepts since there can be a lot of waiting between the stages and before a formal approval can be given. Additionally, it was stated several times that Alpha as a company should have processes, but not as strict as other more traditional automotive manufacturers. It was also stated that an inherent flexibility in the processes is needed since there is a need to be more spontaneous when dealing with new products and services, as Alpha does. Another factor influencing whether the proposed process was followed or not is the challenge of hand-over of the responsibility for ideas/concepts. As the responsibility of the innovation department is to be an internal innovation hub to aid and foster ideas for innovation, employees at the innovation department are supposed to drive certain projects for development until they can be handed over the home department, i.e. the department where the product or service is going to be commercialized. This hand-over of responsibility can sometimes be problematic. As stated by one employee:

*“It is clearly defined what the innovation department is supposed to do, we are supposed to bring an idea to concept and then hand it over [to the home department] before implementation. Why is this not always happening? I think we have to a large extent accepted that there is not always clear and suitable department to hand it [the idea/concept] over to. There simply is not any clear person to hand it over to....it should be clear, so we can gain some speed [in the development]” – employee 1*

The reason for the problematic hand-over had according to the interviewees several different reasons. It could be a mix of lack of resources in time, manpower or capabilities at the home department needed to take over the responsibility. Despite the problematic hand-over of responsibility for ideas or concepts, the majority of employees at the innovation department also expressed that it is their responsibility to “make innovation happen”. Consequently, it is up to the employees at the innovation department to keep developing the ideas and concepts and thus the main responsibility gets transferred to the innovation department. Even with this

new responsibility the ambition and willingness of the employees remain. However, there are some drawbacks as stated by one employee:

*“Since we are working so much on developing ideas and running projects, I do not feel like we, as a department, has enough time to look ahead for new opportunities” - employee 5*

Consequently, Alpha faces a challenge of balancing the need to push on the development needed for their current market while at the same time look forward for new opportunities. This challenge of balancing this trade-off is not only experienced by the innovation department but also other departments. Another factor that has influenced this balance is, as stressed by employees, a lack of prioritization. According to manager 9 this lack of prioritization is due to a too ambitions drive with an *“ambition to do everything”* within the company.

When asked how ideas or concepts were evaluated and finally selected for further development there was expressions from employees that they were often made subjectively in the *discover* phase. In the idea stream managed by the innovation department, incoming ideas were evaluated subjectively in small group meetings. There exist tools to aid the screening and selection, but these are rarely used. As two interviewees stated:

*“We make decisions based on a small group meeting at the innovation department. We have some frameworks, but we do not stick to them all the time. We just use them as a lens. For me it is covered by asking “is it doable?”. We have to be able to launch. It doesn't matter if we can't launch it” - employee 5*

*“The innovation department should not focus on kill ideas, this is better if PB [the portfolio board] does, since they have a broader picture of what is going on in other departments and what projects they have” - manager 1*

When the innovation department has screened and selected which idea or ideas to bring up, they are prepared to be pitched at the management review. According to the majority of the interviewees, the selection criteria used in the management review is not clear since the decisions mostly are done subjectively and based on the experience of each individual executive. Several employees stated that the management review was done to get endorsement and commitment from senior management needed to further develop an idea or concept and that the vast majority of ideas pitched at the management review was approved. However, several employees stated that a problem was that ideas or concepts could get an approval at the management review and then be evaluated once again after it gets approval. Additionally, ideas could get rejected afterwards because the receiving department does not have budget for it. Despite these statements, the majority of employees stated that having the management review was something beneficial for Alpha since it involved top management in the FEI and enabled employees to pitch their ideas, in a relaxed environment, to the senior management. As one manager stated:

*“To get to PB or PO you will have to build a business case for your idea and there it can crack sometimes. The difference between the management review and PB/PO is that in PB/PO you will have to break it [the idea/concept] down and build up a business case around it and there it can stop. We cannot break or stop ideas too early, therefore it is good to have it [the management review]. If you have a good idea, make some nice PowerPoints and gain some traction*

*and support at the management review, in the next step [PB/PO] there will be more deliverables and there you will find out if your idea will fly or not” - manager 6*

The selections made in the line functions, i.e. ideas/concepts not running in the innovation department stream are also mostly done subjectively at first. In the line functions the ideas or concepts are often pitched to the VP of the department the idea originates from. If the VP approves, the idea is further developed before being brought up at the PB or PO pitch. When the interviewees were asked if there were any distinctions made in the evaluation of ideas based on their type, i.e. if the idea were to be categorized as an incremental or more radical, the majority of the interviewees said that it is not made. From the empirical data collected there seems to be little distinction made in the evaluation based on the type of idea. It was, however, a belief from several interviewees that the evaluation of ideas should be different based on the type. As two interviewees stated:

*“I believe that you need different mindset and competencies to evaluate different types [i.e. incremental vs radical] of ideas” - manager 5*

*“I believe that there should be a distinction between “innovation projects” and “regular” projects. You cannot evaluate them on the same KPIs or points” - manager 4*

All things considered, there are mixed views among the interviewees whether the FEI process implemented at Alpha is clear and understandable or not. The interviewees that express concerns regarding the process stress problems of the handover of responsibility and ownership. However, these interviewees also indicate that the work in the FEI is still functioning, even if the process is somewhat unclear. Despite the statement from several interviewees that the process in the FEI is not clear it is important to remember that the process has been changed during the time of this study. The majority of the interviewees believes that this new updated process will be better and enable the organization to better prioritize and track the progress of ongoing projects. Additionally, it is believed by several employees that the distinction between Portfolio board and Project office will be clearer with the new updated process and thus make the process more understandable.

## 5 DISCUSSION

---

*The following chapter will present an analysis and discussion of the empirical findings from chapter four. This chapter will also compare the empirical findings from the case study with the theoretical model presented in chapter two and incorporate new aspects from other theories. The chapter is divided into the five areas presented in section 3.3, namely: Management support, Creativity and corporate culture, Company-wide contribution, Defined focus and Understandable process.*

Since the purpose of this study was to explore what key organizational components that are needed for SMEs in order to succeed in the FEI and investigate whether existing frameworks derived from larger multinational organizations can be translated into smaller and more entrepreneurial firms, this section will elaborate on the theoretical model derived from literature and the empirical data from the case company in order to answer the research question “What are the key components needed for technology driven SMEs to succeed in the front-end of innovation?”

According to Jacobsson (2010, p. 64), generalizability means "seeking support for the conclusions in existing theories and/or generating new assumptions based on careful considerations in the case studies, which should later be compared with theories from new case studies". This is something that Bryman (2002) addresses as key issue, especially with qualitative approaches. Bryman (2002) believes that in qualitative research approaches, it is more appropriate to discuss how well the conclusions in a study can be used in other similar situations and problem descriptions. How well the conclusions of this study can be used in similar circumstances is quite subjective, especially regarding assumptions across industries. In particular, joint venture/SME companies could examine this study and identify similar situations, and then analyze the conclusions and link them to their own case since every company is subject to their own environment. Consequently, a directly scientific generalization becomes complicated (Bryman, 1995; Yin, 2003).

### 5.1 MANAGEMENT SUPPORT: MANAGEMENT SUPPORT TOGETHER WITH ORGANIZATIONAL SUPPORT HAS A CENTRAL ROLE TO SUCCEED IN THE FEI

From the empirical data and literature, it's clearly shown that the top management's support and commitment has a central role in creating capabilities needed in organizations for innovation, especially in the FEI. Not only have the top management the responsibility to influence what type of behaviors that are encouraged, but also the responsibility to support and ensure that creative work, ideas and risk-taking is valued within the organization (Boeddrich, 2004). From the empirical data, most interviews stressed that the support from management is crucial for success. This also goes in line with Ahlgren and Landström's (2018) study where six out of ten companies stressed the importance of support from management. The empirical data also showed that Alpha's management want employees to work on their own ideas and hence showing a tremendous support. Also, it's clear that Alpha's management trusts their employees to actually work on their own ideas and take decisions themselves in order to facilitate “right” behaviors for innovation. This goes in line with researchers stating the value of a trusting management, who encourage autonomous work to explore ideas (Adams et al., 2006; Burgelman, 1983). As several researchers suggest, and in line with Amabile (1997), mistakes and failures should not be feared since it will reduce the risk-taking needed to generate novel ideas. This is also aligned with Stevens (2014), which of whom stress the importance of risk-taking in the FEI. At Alpha, it became evident that management is establishing an open

environment where it's ok to "fail". However, as mentioned by Wycoff (2003), providing feedback is of equal importance for management as showing support. Interestingly, the empirical data showed that Alpha lacking mechanisms for feedback, where it's up to every employee to give or receive feedback informally with unstructured processes. On the other hand, several interviewees expressed explicitly that Alpha could benefit a procedure to learn and incorporate learnings from previous projects.

According to Van de Ven (1986), top management should direct resources and attention to the areas of the organization which are strategically important, which also sends signals to employees what they should focus their time and effort into (Kim & Wilemon, 2002). In addition, when it comes to funding, Wycoff (2003) states that it can be beneficial to provide employees with unspecified resources to explore ideas. The empirical data shows that Alpha is struggling with a non-consistent focus and direction of resources, with lacking prioritization in the FEI. Therefore, a majority of projects is still ongoing or pending. In the FEI at Alpha, there is at the moment no undefined budget post for innovation. Also, the empirical data shows that it's unclear when it comes funding, where the majority of interviewees stressed that the process of getting funds in the FEI is "*over engineered*". According to Gassmann & Schweitzer (2014) and Smith and Reinertsen (1991), the FEI is often overlooked, and management tends to focus more on later stages of innovation where processes are more clearly defined with well documented roles and responsibilities. In the case of Alpha, the FEI is given attention since management is aware of the huge opportunity to leverage the potential of innovation in the early stages. However, with the limited resources and time, the projects in the FEI have from time to time been neglected. Whether this neglect could be generalized to organizations in the same situation as Alpha is uncertain, but it's reasonable claim that a focus at the FEI is vital for the innovation process.

Interestingly, as mentioned above, even if Alpha's management promote innovative work and supports an open environment with nonhierarchical structures to enhance creativity, there is an unclear distinguishment of what 'support' comprehend in literature (see Amabile 1997; Wycoff, 2003; Boeddrich, 2004; Stevens, 2014). At Alpha, employees express explicit how much support they get from management to be innovative, in terms of encouragement. However, as observations has shown, there is a lack of support from management in terms of underlying structures and processes to be innovative. To put it simply, even if the management encourages employees to work on their own ideas, employees still have difficulties to fulfill this due to lack of underlying support (e.g. there is a lack of structures to support employees with time, resources or fortitude). Specifically, there is an ambition from top management, but Alpha does not have fundamental conditions to work with innovation throughout the whole organization. This might be due to the fact that Alpha is still in phase of expansion or that Alpha, simply might have overlooked this. Nevertheless, the term 'support' is somewhat vague in literature and should be fragmented further with a distinguishment of top management support (encouragement) and organizational support (underlying structures). At least, there needs to be more emphasis on underlying structures in literature. In addition, this management support is so strong at Alpha, so employees feel comfortable and empowered to actually "go around" set processes to solve problems and drive innovation forward. Consequently, our findings indicate that there is support to primarily solve problems, rather than follow directives to strictly follow processes. As described in the result, the management review as a forum is useful both since it gets top management involved early in the FEI and because it really shows how enthusiastic and supportive the management is. However, as of today, a negative aspect can be that the evaluation is too subjective and its most for "the political game". Alpha does not have the resources to produce innovative offers that do not create any value "right now".



## 5.2 CREATIVITY AND CORPORATE CULTURE: VITAL TO FOSTER A CREATIVE CULTURE WITH THE “RIGHT” INDIVIDUALS

In order for organizations to become innovative, it's important to foster a creative culture that enables employees to generate new ideas. As several researchers suggest, the work itself and the social environment is strongly correlated with the level of creativity (Amabile 1997; Ahmed 1998; Riel et. al. 2013). It becomes evident from the empirical data that Alpha puts a significant amount of emphasis to create a creative culture to foster innovation. Interviewees even expressed the culture as being one of Alpha's biggest strengths where a drive, ambition and commitment to change things is evident, as compared to traditional car manufacturers. In line with Amabile's (1997) three elements of creativity, Alpha as an organization that stress the importance on hiring “creative” individuals to build and foster a “start-up” culture and mentality. Much effort is placed on diversity of background, gender and age to create a creative setting with right expertise, creative-thinking skills and motivated employees. Alpha has even focus on employing talent from other industries than the automotive in order to find new ways of working.

To look at the culture in another way, it's equally important for management to foster a create culture with the “right” people, as creating an atmosphere within the firm to stimulate and motivate employees to cooperate, challenge each other and work cross-functionally (Amabile, 1997). Similarly, Koen et. al (2001) stress the correlation of cultural factors within an organization to innovation performance as high and Martins and Terblanche (2013) stress that values in an organization either support or restrain creativity. In the case of Alpha, it's evident that the management puts efforts in establish an informal, open-minded, social environment where employees can blossom which goes in line with previous research. The majority of interviewees clearly expressed that employees can meet and share information to foster new ideas, indicating that the culture factor is vital in the FEI. In research, there are several methods, techniques and tools in order to stimulate a creative culture which also became evident at Alpha. Alpha's internal idea platform is a clear example of how ideas can be shared with the whole organization, where employees can participate to develop the ideas further. However, as executives at Alpha and Ahmed (1998) stressed, these tools are only there to help and when everything comes around with innovation, it still comes down to the culture of the company. As Ahmed (1998) explains, only because a company uses methods to enhance creativity, they by default does not become innovative - underlying structures with right cultural environment is the foundation, which was clearly evident in the empirical data.

In order to utilize the diverse workforce and to foster a corporate culture, it's according to the empirical data up to the management at Alpha to set the pace for the culture and foster a creative setting, which is also in line with literature. As previously touched upon, one of Amabile's (1997) three elements of creativity of is motivated employees. A tool to conduce and improve motivation is through a reward system, which in research is heavily debated whether it's positive or not. Likewise, at Alpha there are also mixed opinions about rewards in the FEI. Some argue that to incorporate a process for rewards and not only fame to encourage employees to innovate would be beneficial, which share similarities with Saleh and Wang (1993) opinions. Saleh & Wang (1993) means that in order to promote agreeability to change and risk-taking, a reward system is advantageous and a productive method to enhance a coveted creative climate. Others at Alpha argue that *“it's part of the work here at Alpha and we are all responsible, one should not expect a bonus of some sort”*, which is more in line with Schilling (2013) who means that a reward system can subvert a creative setting. While looking into research about rewards, Chang et al. (2007) endorse a reward system in between Saleh & Wang (1993) and Schilling (2013), where a team is rewarded instead of the sole inventor. According to Chang et al. (2007),

in today's business climate projects are far more cross-functional with input of knowledge coming from a wide range of departments and thus, the team should rather be rewarded for their efforts. In view of this, even if reward system has been successful at specific organizations to enhance motivation to foster a creative culture, it's varies from company to company. However, what can be said is that to create a creative culture for innovation, employees need a social open-minded setting where they have the opportunity to network and collaborate, which is clearly shown in the empirical data and literature.

### 5.3 COMPANY-WIDE CONTRIBUTION: INNOVATION MUST COME FROM THE WHOLE ORGANIZATION, AND NOT ONLY FROM A SINGLE ENTITY

In both literature and across the majority of interviews at Alpha, the importance of cross-functional collaboration between departments in the FEI was highlighted to a great extent. At Alpha, the management has set focus to involve the whole organization where the innovation department is supposed to facilitate this at all departments, which clearly goes in line with Riel et al. (2013). Riel et al. (2013) argues that the responsibility of an organization's efforts to generate new creative ideas is not the responsibility of any single department. Instead should the responsibility to drive innovation be shared with all departments and functions within an organization. Interestingly, the empirical data shows that there are mixed opinions about the innovation department at Alpha as described in chapter four. Reasons for this might be due to a lack of communication from the top management of the purpose of the innovation department or because the organization have expanded fast during a short time of period. It might also be due an uncertainty, where employees are unfamiliar with an innovation department and don't see the work that comes out of from the innovation department. Nevertheless, it's crucial that Alpha establish a common ground for the innovation department and communicates this throughout the whole organization to avoid that innovation only takes place at a single department. To look at this in another way, one could argue that all departments at Alpha contribute to innovation today since they develop a service that is not on the market and therefore comes up with new novel ideas for their service. However, it's reasonable to claim that in order to stay innovative in the long term, innovation needs to happen at all levels throughout the organization.

Organizations that encourage employees to work cross-functionally and let employees interact across functional boundaries, not only generate more ideas but also build larger personal networks and can increase the quality of ideas (Amabile, 1997; Wycoff, 2003; Björk & Magnusson, 2009). This became evident at Alpha as well, where top management promotes interactions and stimulates cross-functional cooperation, which is for example done through the internal idea platform and cross-functional workshops. As stated by the majority of employees at the innovation department, the problem for Alpha is not the amount of ideas they generate, it's more the actual implementation of ideas. Additionally, according to Riel et al. (2013) and Koen et al. (2001), it's crucial to design the process of projects as understandable as possible, to reduce the need for additional efforts and make the ideas adoptable by other departments involved in the development. At Alpha, this have occasionally been problematic where actual delivery of projects between gates have not happened as intended. This might be due to fact that business unit managers have not fully bought into and showed commitment for the idea, and therefore the idea does not become successful (Wycoff, 2003). Even if cross-functional collaboration was pointed out as crucial at Alpha, researchers have found negative aspects as well. According to Song et. al (1996), collaboration across business units could be problematic due to lack of trust, varying values, languages and goals, whereas lack of trust was the only factor found at Alpha. In the view of cross-functional collaboration, something that Alpha puts

efforts into is to avoid the ‘not-invented-here’ syndrome, which is a pessimistic stance against “things” from an external source (Kathoefer & Leker, 2012), where the top management encourage the owner of the idea to lead the development of the idea, which is of great importance in the FEI. However, the owner of an idea does not always have time to lead the development of the idea and thus, the empirical data indicates that there is a trade-off between avoiding the ‘not-invented-here’ syndrome and time management. To put it simply, an employee might not have sufficient time to lead the development of his/her idea and therefore will not present it. All in all, it's obvious that cross-functional collaboration is crucial in the FEI as presented by researchers in chapter four and expressed by the majority of interviews at Alpha. This is also verified by other researchers as Choi and Thompson (2005), Song et al. (1996) and Souder (1981).

#### 5.4 DEFINED FOCUS: PRIORITIZATIONS OF INNOVATION PROJECTS SHOULD ALIGN WITH THE OVERALL STRATEGY OF THE ORGANIZATION

The creation of an innovation strategy should be all organizations first step to manage innovation according to Goffin and Mitchel (2016). When the strategy has been formulated it must be implemented and communicated throughout the entire organization, and at every level and department. It is also important that the strategy is well understood, and all employees understands its role for the company (Merchant & Van der Stede, 2012; Goffin & Mitchel, 2016). As found in the empirical data, Alpha does not have an explicit innovation strategy. Instead of an innovation strategy the organizations vision to transform the market acted as a guiding vision. Even though, many researchers agree on the importance of having a guiding innovation strategy (Goffin & Mitchell, 2016; Refinejad, 2007; Koen et al., 2001; Reid & Bretani, 2004) many companies do not have a clear strategy for innovation according to Riel, Neumann and Tichkiwitch (2013). Although, Alpha does not have an explicit innovation strategy they have a guiding vision which according to several of the interviewees, both executives and employees, guides and aids the organization in the FEI. This vision revolves around the notion to provide flexible mobility to all its potential customers in an end-user friendly way. Consequently, in the case of Alpha the vision of the organization, to some extent, acted as a substitute for an innovation strategy. The consequences of not having a clear strategy which guides organizations in their prioritization generates an increased risk of making the decisions made in the FEI ineffective (Khurana & Rosenthal, 1997).

As found in the empirical data, the employees at Alpha state that the lack of focus has affected the organization negatively. Several employees and executives state that there are many ongoing ideas and projects, but with no clear prioritization and direction from management. Additionally, dependencies between ideas and concepts in the FEI and in later stages of the process has not been mapped out or visualized sufficiently, this in combination with a non-adequate prioritization have resulted in a situation where many ideas have not even passed the earliest stages of development at the anticipated pace. To argue that an innovation strategy would have solved the challenges at Alpha would not be a reasonable conclusion, but the increased focus that comes with an innovation strategy would most likely been beneficial for an organization with ambitious goals as Alpha. Most organizations have scarce resources in terms of capital, time and manpower, this is especially true for R&D organizations where decisions must be taken on how to utilize these scarce resources in the most effective and efficient way (Reid & Bretani, 2004). Consequently, it is important for an organization to have a structure to guide the decision making on which ideas to prioritize and select for further development (ibid.). Whether this structure comes from an explicitly stated and defined innovation strategy or from clear management direction and decision is of second importance,

what is most importance is that clear direction and prioritization is given. A reasonable explanation why Alpha ended up in a situation with insufficient prioritization and focus can be a combination of having very high ambitions and goals, i.e. disrupting to automotive industry, with a very rapid growth. Furthermore, Alpha can be considered as financially strong. Thus, there has not been a strong pressure on Alpha to narrow its focus due to financial reasons. On the other hand, a newly founded company of a similar size as Alpha, but without the financial means, will likely face a much stronger pressure to narrow its focus. Consequently, it can become difficult for management to make decisions on prioritization, i.e. pause or reject ideas or projects, since it potentially could reduce the possibility of reaching the goals of the organization.

Throughout the empirical findings, the majority of the interviewees stated that they believed that more focus would be beneficial for Alpha. It was believed that a strategy would enable the organization to better prioritize resources and therefore increase the pace of development. These opinions are supported by Strecker (2007) who means that innovation activities should be concentrated to a few “innovation fields”. By carefully selecting these innovation fields and direct resources to them the probability for innovation success increases. Organizations should not “*pursue whatever innovation opportunity emerges and looks promising*” (Strecker, 2007, pp. 212) but instead carefully select a few. As already mentioned, the majority of research revolves around larger multinational organizations, but the findings made in the study by Strecker (2007) is relevant to all types of organizations regardless of “*size, industry, geography, R&D rate and environmental uncertainty*” (ibid., pp. 213). As previously mentioned, organizations often have scarce resources in terms of capital, time and manpower and these scarce resources must be allocated in the most effective and efficient way (Ried & Bretani, 2004). Consequently, it can be beneficial for organizations similar to Alpha to identify and define which innovation fields they seek to pursue and focus on. A reasonable assumption is that it would enable better allocation of resources since the defined innovation fields would provide clear guidance on where to allocate the resources. Interestingly in the case of Alpha, time and manpower was found to be the scarcest resources. This finding is interesting since it can aid organizations with similar characteristics as Alpha. Although, capital may not be the most limiting resource, the findings indicate that systems and/or structures should be in place to direct the effort and resources in the FEI.

An innovation strategy should be used to define long-term goals, such as sales, profits and growth generated from new products. According to Holahan et al. (2014) organizations should distinguish whether the ultimate goal is to generate technological advances (technology driven) and/or customer benefits (customer driven). Where the technology driven focus on technological novelty and advancement and customer driven focuses more on creating value for the customer and commercial opportunities (ibid.). Additionally, Strecker (2007) brought up six dimensions that should be considered when defining an innovation strategy namely; *innovativeness, timing of market entry, driver of innovation, source of innovation, investment level, and distance to core business*. As previously mentioned, Alpha has a strong vision which, to some extent, has acted as a substitute to an innovation strategy. Even though Alpha has not explicitly stated it, or defined it in a strategy, the findings indicate that the executives and employees at Alpha has a good understanding *how* the organization should drive innovation. Additionally, Alpha has an ambition to include not only internal stakeholders but also external, such as suppliers, customers and others in the FEI. With this in mind, it can be said that in terms of *driver of innovation* Alpha seems to pursue to be a mix of market and technology orientation by providing a new service with technology. In terms of *innovativeness* and *timing to market*, Alpha is a first mover and the degree of newness from a market perspective is high. As

previously mentioned, Alpha strives to tap into the creativity of both internal and external stakeholders by involving them in the FEI and allowing them to be part of the development process, therefore the *source of innovation* would be defined as a mix of internal and external. Consequently, four out of the six dimensions by Strecker (2007) could be identified. Since the organization has such a strong vision and good understanding about *how* to drive innovation, it is reasonable to assume that little additional effort is needed to explicitly define an innovation strategy derived from the vision of the organization.

In the empirical data it was also found that there are currently no KPIs in place to measure innovation. Whereas some interviewees stated that it could be beneficial, others rejected the idea of measuring innovation, as one employee expressed “*you cannot measure innovation*”. Whether to use KPIs or not, there is according to Koen et al. (2002) a benefit of using a limited number of simple metrics used to track the “*idea generation and enrichment*” (pp. 20) in the FEI. These measurements could include, the percentage of ideas commercialized, percentage of ideas that have become a formal project, i.e. exited the FEI and entered the later more formalized development process (ibid.). It is reasonable to assume that measurements could be beneficial, and the measurement suggested by Koen et al. (2002) is not suitable since they do not consider the actual value of the idea. Upon reflection, it becomes clear that measuring the percentage of ideas generated or percentage of ideas moved into the later stages of development does not correlate with performance of success in the FEI. As previously mentioned, the empirical findings suggest that there are too many ideas under development at Alpha. Consequently, there is a risk that the situation would only worsen by employing the measurements suggested by Koen et al. (2002) since it could result in the organization to approve ideas only to improve the metrics without considering the quality of the ideas. However, with Alpha’s high ambition and eagerness to develop and commercialize innovative offers it is reasonable to assume that some metrics would be beneficial to monitor the effectiveness and efficiency in the FEI. If an organization would want to improve the FEI process, then both the efficiency of the process and the output of the process should be measured. Without measurements it can be difficult to conduct improvement initiatives since little data is available on the current performance of the process or the output. This statement is supported by Goffin & Mithell (2016) who stresses the importance of not only measure the output but also the efficiency of the process.

As described in chapter three, an idea can be generated in two ways (Koen et al., 2001). Firstly, an idea can be generated after opportunity have been identified. This opportunity can be an answer to a competitor move, a newly discovered customer need or a technological breakthrough opening up for new business opportunities. The second way to generate ideas is of a more opportunistic manner, i.e. ideas that have been generated not explicitly based on an identified opportunity (ibid.). As found in the empirical findings, many ideas are generated in an opportunistic manner, this is especially true for the ideas running through the *out-of-the ordinary* stream managed by the innovation department. Although an opportunistic idea generation is not negative per se, it has been found that a more balanced generation is needed. As previously mentioned, the majority of the interviewees at Alpha believed that a stronger overall focus would be beneficial for the organization This finding goes in line with the interviewees made at the innovation department, where the majority of the employees stated that they believed that a stronger focus was needed already in the idea generation phase, named internally as the *discover* phase. Additionally, the majority of the interviewees stated that more ideas should be generated based on opportunity identification. As found in the empirical data, there are challenges in generating ideas based on identified opportunities. First, with no product/service on the market, no customer data and/or feedback is generated. Consequently,

no opportunities can be generated based on customers actually using the product/service. Secondly, there has been mixed expressions that the market intelligence available at Alpha is either not “good enough” or not available in the right quantities. Since the uncertainty is at highest in the FEI according to Stevens (2014) it can be difficult to make rational data driven decisions (Lane & Maxfield, 2005) without a product on the market and with limited market intelligence. Consequently, it’s reasonable to assume that it’s important for organizations similar to Alpha to collect, structure and communicate the available market intelligence to the departments in need of it, especially if the organization does not yet have a product/service on the market. With a transparent collection and distribution of market intelligence the uncertainty in the FEI could be reduced and more data driven decision could be made (Stevens, 2014; Lane & Maxfield, 2005).

As found in the empirical data, the employees at the innovation department have different opinions on how much they should limit themselves, where some want to be more focused than others. Since the purpose of the innovation department is to be an internal innovation department where “crazy” ideas can be generated and developed, there are both positive and negative aspects of having a more focused idea generation. The positive aspects of having more focus is that an organization can focus attention and resources to fewer areas. This goes in line with Reid and Bretani (2004) who argues that organization must effectively and efficiently allocate the scarce resources of an organization into the most important areas and activities. Although there are positive aspects with more focus one must reflect whether an innovation department should have focus at all. Interestingly, here is a difficult trade-off that must be managed. The innovation department should be focused enough to generate and develop ideas that create actual customer value, while at the same time be open enough to see beyond the organizational barriers and scout for emerging technologies and trends. As found in the case of Alpha, it has been found that it can be beneficial to have a narrower focus. Consequently, the findings in this study indicate that organizations, like Alpha, with high ambitions and limited time, additional efforts should be made to channel its resources to the most critical areas before entering a more operational phase. After an organization has entered a more operational phase, the focus should be widened to fully enable to organization to scout for new emerging trends.

## 5.5 UNDERSTANDABLE PROCESS: IMPORTANT THAT THE INNOVATION PROCESS IS CLEAR ENOUGH TO GUIDE EMPLOYEES IN *HOW* TO WORK WITH INNOVATION AND *WHO* HAS THE OWNERSHIP OF THE PROJECT

Throughout the empirical data it is evident that there is an ambition at Alpha to “do things differently”. With its high ambition to transform and disrupt the automotive market it was found in the interviews that Alpha strive towards less formalized processes compared to other more traditional automotive manufacturers in order to foster creativity and innovation within the organization. As mentioned in chapter three, the theoretical framework, there is an ongoing discussion in the research to which extent the process and structures should be formalized or not in the FEI. Whereas several researchers, such as Nobelius and Trygg (2002), and Backman et al. (2007), argues for less formalized processes with more flexibility others argues that more formalized processes are more beneficial in the FEI (Kim & Wilemon, 2002; Holahan et al., 2014). Consequently, there is a chance that Alpha’s ambition to “do things differently” and have lesser formalized processes compared to more traditional automotive manufacturers can be negative for its overall innovation performance. According to Holahan et al. (2014) and Ahmed (1998) there is a need to have formalized processes and structures since it is positively associated with overall innovation performance. Despite the ambition of doing “things differently” and less formalized compared to more traditional automotive manufacturers there

is currently a process in the FEI at Alpha, presented in chapter 4. Whether this process would be categorized as formal or not, is uncertain. This is because there exists limited guidance in the research in how that distinction could be made. Additionally, it is made more difficult since the majority of research is based on larger multinational organizations. As described in chapter 3, there exist a wide range of proposed activities and phases in the FEI brought up by different researchers. The chosen framework for the activities in FEI is composed of an idea generation phase, followed by an idea's selection phase (Riel et al., 2013). Although, the activities proposed by Riel et al. (2013) do not have the same names as Alpha's own process they share many characteristics. As seen in chapter four, ideas are generated in the discover phase. After a screening in the discover phase the idea or concept moves to the subsequent define phase where a formal decision is taken whether the idea or concept is worth pursuing or not. Consequently, it can be seen that the process and activities implemented in the FEI at Alpha is rather generic and contains the same characteristics as the framework by Riel et al. (2013), that is, a phase for idea generation followed by a phase for idea selection.

As mentioned in chapter four, one of the success factors for innovation was identified as understandable process. The process should be clear enough to allow employees within the focal firm to easily monitor and understand what is happening to their idea (Van de Ven, 1986). Throughout the empirical data it became evident, that the majority of the employees at Alpha does not consider the current process as clear and understandable. A poorly designed process in the FEI can, according to Amabile (1997), have negative effect of the creativity of the individuals in the organization. Interestingly, no evidence was found throughout the empirical data that the process itself reduced the level of creativity of the employees. Instead, employees felt empowered by the management support and culture at Alpha so that they, on occasions, could side-step from the process when found necessary. This behaviour have shown both positive and negative aspects of the current processes and structures at Alpha. On the positive side, employees feel empowered, creative and driven to push ideas forward despite organizational or structural hinders. However, on the other side, there is an implemented process that is being sidestepped because of the perceived complexity. Additionally, interviewees felt that the process had been made too complicated with the two different forums Project office and Portfolio board. The interviewees expressed opinions that they did not know the difference between them, and it made the overall process more difficult to overview. This is according to Boeddrich (2004) and Wycoff (2003) negative since the process should be clear and transparent.

As described in chapter four, the ideas generated in the *out-of-the-ordinary* stream is governed and developed by the innovation department. The responsibility of the innovation department is to develop and co-develop the idea together with the ideator and at a later stage hand over the ownership to the line organizations. However, as found in the empirical data this is currently a challenge at Alpha. The employee's states that they understand the purpose of this transfer, but it is rarely done due to organizational barriers, lack of competence and/or resources at the receiving department. Consequently, there is a situation where a part of the process is perceived as clear and understandable, yet it is not being followed. The FEI process should according to Riel et al. (2013) and Koen et al. (2001) be seamlessly integrated into the later, and more formalized, stage-gate processes. Additionally, it is important to design and structure the process, so it reduces the need for additional efforts and make the ideas adoptable by other departments involved in the development (ibid.). Furthermore, it is according to Wycoff (2003) important that business managers take on ownership and devote the scarce resources of capital, time and manpower into the development of the idea. As found in the empirical data there is currently a challenge at Alpha to achieve this seamless integration when transferring the

ownership of ideas to the receiving department. Interestingly, in chapter three it has been identified that the literature focuses on *how* to work with innovation and what is needed of the process, but little attention is given to *who* within the organization that works with it. As found in the empirical data, the question of *who* works with innovation in the different stages is equally important to *how* it is conducted. Consequently, the literature to include not only *how* the work should be done but also the importance of having predictable responsibility and ownership for the ideas throughout the FEI.

The main reasons which makes this transfer difficult at Alpha seems to be lack of competencies at the receiving department. As found in the empirical data the organizational capabilities do not always match the purpose of the process. In other words, the receiving department have on occasions not possessed the necessary skills and capabilities needed to take on the development of the idea or concept making a transfer difficult. Despite this problematic hand-over, the employees at the innovation department sees it as their responsibility to “make innovation happen”. Consequently, the main responsibility of developing the idea never leaves the innovation department as it is supposed to do. Even though the majority of the employees are willing and motivated to have this responsibility there is a conflict of interest. Whereas the employees at the innovation department states that they are willing and motivated to keep the main ownership and responsibility of the ideas and concepts it reduces their possibility to explore for new opportunities which is also their responsibility. The challenge of balancing the exploit and explore activities is not uncommon for organizations and it is according to Gassmann and Schweitzer (2014) a balancing act between exploit and explore. This statement is supported by O’Reilly and Tushman (2008) who stress the need for organization to balance these two activities.

However, this balance might not be so clear for Alpha as it is for other larger more traditional organizations. A reasonable assumption is that larger and more traditional organizations have a greater need and reason to balance their exploiting activities with explore related activities since they are more bound by their core business model. When analysing the activities and services currently under development at Alpha the majority would be categorized as explorative and not exploitive, simply because most of the services Alpha is developing does not exist on the market today. Consequently, there seems to be an imbalance towards explorative activities currently at Alpha. Therefore, the question arise, how does a newly founded organization balance the exploitative and explorative activities when the services or products they develop are so explorative by nature? And secondly, is the balance act brought up by O’Reilly and Tushman (2008) relevant to these types of organizations since they are so explorative by nature? To answer these two questions more research is needed, but highlights the notion made previous in this thesis that the majority of research has been conducted on lager multinational organizations and not on companies in similar position as Alpha.

According to Nobelius and Trygg (2002) there is a need for flexibility in the FEI and it should be prioritized. How much flexibility that is needed in the FEI is as previously mentioned an ongoing discussion in the research community. However, most researchers agree with Nobelius and Trygg (2002) and Backman et al. (2007) that flexibility is needed in the FEI to handle different types of ideas, concepts and projects, ranging from incremental innovations to radical. As found in the empirical data, there is a distinction between the type of ideas at Alpha where the ideas are separated in the three different streams in the FEI. This distinction is positive according to Nobelius and Trygg (2002) as it enables the organization to handle, prioritize and properly staff the different ideas depending on their characteristics. On the negative side, there is little distinction made on whether the idea is incremental or radical, e.g. it will not alter the



process or deliverables if an *infrastructure* idea would be of incremental or radical in nature. Consequently, there might be a need to further distinguish the type of ideas, i.e. if its incremental or radical, and what type of metrics that are used during their development in the FEI and subsequent phases. Additionally, it was found that little or no distinction was made after the three separate streams were merged in the *define* phase. The use of three different streams in the FEI has both positive and negative aspects. It is as stated by Nobelius and Trygg (2002) beneficial to distinguish between the type and characteristics of an idea during development. On the negative side, one could argue that having three separate streams creates confusion for the employees, as found in the empirical data. An alternative approach could be to have a single stream in which the ideas are defined and categorized based on whether they are radical or not, and on their characteristics, e.g. if multiple departments is needed during the project. In a sole stream the various ideas could be evaluated upon different metrics and criteria which according to Koen et al. (2002) and Nobelius and Trygg (2002) is beneficial since incremental and radical ideas should not use the same evaluation process since a too formalized process can harm the creativity and reduce the generation of radical ideas.

The idea screening and selection process should include a set of criteria which are used to assess and compare the ideas and concepts (Carbonell-Foulquie et al., 2004; Hart et al., 2003). Additionally, the idea generation and selection process should be clear and transparent for the employees and thus, aids them in the process of exploring new opportunities in the surrounding environment (Boeddrich, 2004). Metrics used to screen, evaluate and select ideas should be known beforehand by the employees so it is known under which criteria their ideas are evaluated and then, selected or rejected upon (Wycoff, 2003). As found in the empirical data, the screening and selection process are often done subjectively at Alpha either in small group meetings or at the management reviews. Although, subjective decision is not negative per se, the idea screening and selection process should include criteria under which the decision is based upon. Without the use of predefined criteria to use in the screening and selection it can be difficult for employees to know which criteria that are used to evaluate their ideas. Interestingly, it exists an internally developed framework to evaluate the ideas, but it is used more “as a lens” as stated by one employee, than an actual tool to screen and select ideas. According to Koen et al. (2002) it is important to balance the use of subjective and objective measures in the screening and selection phase of the FEI. Consequently, there might be a need for Alpha to include more objective measurements earlier in the FEI. However, it is important to remember that the purpose of the screening that take place prior to the PO approval in the *define* phase is not to find the best idea, or to “kill innovation”. The screening that take place in the *discover* phase is more to narrow the funnel as described by Wheelwright and Clark (1997), i.e. to make a “rough screening”. Consequently, the balance proposed by Koen et al. (2002) must be managed carefully, in order to not kill ideas too early.

As described in chapter 4, the decisions, or pitches, marking the end of the *discover* phase is conducted at the review at Portfolio board, Project office or the management review, depending on which stream the idea is placed. In the subsequent phase *define* phase, the decision is to either kill or approve the idea which is made at the PO review, which also marks the end of the FEI at Alpha. Interestingly, it was found in the empirical data that the participants in the Project office, Portfolio board and the management review are often the same VPs or managers. Consequently, it can be argued that the decision making is rather centralized. According to Moenaert et al. (1994) can a too much centralized decision-making harm the organization by reducing the development speed and discourage individuals from taking own decisions. However, no findings indicated that there was a reduction of speed or that employees were discouraged from taking own decisions. While some decisions must be made at higher levels

within an organization other could reside on lower levels to increase the overall speed of development, not only in the FEI but also in the later stages. If top management would be able to set clear innovation strategy for the organization with clear and tangible goals and a distinction of how much resources to allocate to the different nature of ideas, i.e. incremental or radical, parts of the decision making could be given to lower levels of the organization. This could potentially provide the employees with greater autonomy and faster development speed, but at the cost of decreased governance and steering possibilities for the top management and steering groups.

When discussing the findings from the empirical data, the process is not clear and transparent, or whether the metrics used are sufficient, it is important to remember two aspects that can have influenced the results. First, the process implemented at Alpha was changed during the time of writing this thesis. This might have influenced the results related to whether the current process was understandable or not, as the change might have contributed to confuse the employees. However, the results are still considered as valid since the data collection was conducted before, during and after the change in the process. Additionally, many of the aspects that were considered as unclear in the process was not affected by the change. Secondly, one must consider the fact that Alpha is considered “new” compared to traditional automotive actors and has grown rapidly during the last couple of years. It is therefore a reasonable assumption that this rapid growth has had an influence on the result, as new employees are hired, and processes are altered, updated and/or changed to keep pace with the organizational growth.

## 6 CONCLUSION

---

*The following chapter will describe the conclusions and theoretical contributions derived from this thesis. Subsequently, the limitations and areas of future research will be presented.*

The research question of this thesis has been to identify what key success factors are needed to succeed in the FEI for SME's. Based on the existing literature on front end of innovation a model was created. This model was derived from the literature study were different key success factors needed for organizations in the FEI were reviewed and identified from previous research. From the literature study five key success factors was identified, namely: Management support, Creativity and corporate culture, Company-wide contribution, Defined focus, and Understandable process. This model was applied to the case company Alpha, where it was used to benchmark the case company's current position against the identified key success factors in the model and to assess the company's current execution of activities in the FEI. Additionally, since the majority of research in the FEI is conducted at larger multinational organization the created model was applied to the case company to assess whether or not it was applicable to smaller organizations as well.

The findings in this thesis indicates that the key success factors in the model which has been derived from research on larger multinational organizations is applicable to smaller organizations as well. Essentially, the framework of the five key success factors fits well with the result, however on some points the results deviate compared to the framework. The factor Understandable process appears to be of lesser importance at the case company compared to other success factors identified in the literature. Whether this is general for smaller organizations is a question for further research. However, a reasonable explanation is that there is a greater need for larger organizations to have an understandable process since there are many more stakeholders, departments and employees involved. Consequently, the level of complexity of the process presumably increases with more involved actors and dependencies, thus increasing the need for an understandable process for larger organizations. As found at Alpha, the process is considered as not understandable, but the flexibility and management support at Alpha allows the organization to drive innovation forward even though the employees do not consider the process to be understandable. The finding indicating that the key success factors does not have equal importance is interesting since no previous research, neither on small or large organizations, has set out to identify which key success factors are of greatest importance and which that are of second importance. However, since this thesis is conducted with a case study at a single company further research is needed to validate this finding.

The key success factors identified in the literature study have been found to be applicable to smaller organizations as well. However, findings in this thesis indicates that additional aspects of two key success factors needs more emphasis of their importance in the literature. Firstly, the success factor Management support emphasizes the importance of encouragement and backing from top management which has been found to be of great importance for both small and large organizations. However, the results suggest that the importance of ensuring underlying structures has been somewhat underemphasized in previous literature. Simply put, there should be underlying structures and management support from the organization which allow employees to pursue and develop their own idea. Despite that an organization might have strong management support, it is vital to create the fundamental conditions to allow employees of the firm to work with innovation. Consequently, the term 'support' is somewhat vague in the literature and could be further fragmented by a differentiation of top management support and

organizational support, i.e. underlying structures. All in all, the importance of underlying structures needs more emphasis in literature.

Secondly, even though the success factor Understandable process was identified not to be the most critical for smaller organizations, the findings indicate that more emphasis should be given to the aspect of ownership and responsibility. From the literature study, it became clear that the success factor Understandable process refers to having a clear and transparent process of *how* to work with innovation and what is needed in the different stages of the process. However, little attention is given to *who* within the organization that works with it. As the findings indicate the question and uncertainty of responsibility and ownership of an idea in the FEI is of equal importance as having a clear and transparent process. Consequently, the success factor Understandable process should put equal emphasis on *who* works with innovation, i.e. having a predictable responsibility and ownership, and not mainly stress *how* to work with innovation throughout the FEI.

As previously mentioned, the majority of previous research on the FEI has been conducted on large multinational organizations (Riel, Neumann & Tichkiewitch 2013; Stevens 2004; Koen et al. 2001; Veryzer 1998; Holahan et al. 2014; Khurana & Rosenthal 1997). Consequently, this thesis contributes to the theory by providing insight into how a smaller organization structures and execute the FEI. Additionally, even though Veryzer (1998) urged a need for further studies on how existing frameworks could be translated into smaller and more entrepreneurial firms twenty years ago, Floren et al. (2017) also stress this need which indicating that more research is needed. Consequently, this study contributes to the research of both Veryzer (1998) and Floren et al. (2017).

Although, this thesis has provided insightful findings there are some limitations. The main limitation is that this thesis is based on one case study. Additionally, there is limited research on FEI at smaller organizations and more research is needed in general. Consequently, more research is needed on SMEs to validate and refine the result and findings in this thesis. A quantitative research could potentially be a suitable complement to this thesis by researching if the findings are valid in smaller organizations and if there are any differences across industries/sectors. Furthermore, additional research should be conducted to develop the model in this thesis into a framework that can aid organizations in evaluating their strengths and weaknesses in the FEI. Additionally, an interesting future research could be to research how to measure the relative importance of different success factors. As described in section 5.2, researchers bring up different theories on how to encourage employees with rewards, which could be an interesting field for future research in how to motivate employees to work with innovation. Also, another area for future research is the question whether it is suitable to actually measure innovation in the FEI.

## REFERENCES

---

- Adams, R., Bessant, J., & Phelps, R. (2006). Innovation management measurement: A review. *International Journal of Management Reviews*, 8(1), 21-47.
- Abrell, T., Pihlajamaa, M., Kanto, L., Brocke, J.V. & Uebernickel, F. (2016). The role of users and customers in digital innovation: Insights from B2B manufacturing firms. *Information & Management*, vol. 53(3), pp. 324-335.
- Ahlgren, H., & Landström, M. (2018). Success within Front End of Innovation. KTH Royal Institute of Technology. School of Industrial Engineering and Management.
- Ahmed, P.K. (1998). Culture and climate for innovation. *European journal of innovation management*, vol. 1(1), pp. 30-43.
- Alam, I. (2006). Removing the fuzziness from the fuzzy front-end of service innovations through customer interactions. *Industrial Marketing Management*, vol. 35, pp. 468-480
- Alvesson, M. & Sköldböck, K. (2017). Reflexive Methodology: New Vistas for Qualitative Research, 3rd edn, SAGE Publications Ltd.
- Amabile, T. (1997). Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review*, vol. 40(1), pp. 39-58.
- Aquil, M. A. (2013). Project Management in SMEs. *Journal of Strategy and Performance Management*, 1(1), p.8-15.
- Backman, M., Börjesson, S. & Setterberg, S. (2007). Working with concepts in the fuzzy front end: exploring the context for innovation for different types of concepts at Volvo Cars. *R&D Management*, vol. 37(1), pp. 17-28.
- Bilton, C. (2009). Management and Creativity: From Creative Industries to Creative Management, Oxford: Blackwell Publishing

Björk, J. & Magnusson, M. (2009). Where do good ideas come from? Exploring the influence of network connectivity on innovation idea quality. *The journal of product innovation management*, vol. 26(6), pp. 662-670.

Boeddrich, H.J. (2004). Ideas in the workplace: a new approach towards organizing the fuzzy front end of the innovation process. *Creativity and Innovation Management*, vol. 13(4), pp. 274-285.

Bos-Brouwers, H. E. J. 2010. Corporate sustainability and innovation in SMEs: evidence of themes and activities in practice. *Business Strategy and the Environment*, 19(7), 417-435.

Bryman, A. (1995). *Research methods and organization studies*, 3ed. New York: Routledge

Bryman, A. (2002). *Social research methods*. Malmö: Liber.

Bryman, A. (2012). *Social research methods* (4th edition). Oxford University Press

Bryman, A. & Bell, E. (2007). *Business research methods*. Oxford: Oxford University Press

Bryman, A. & Bell, E. (2015). *Business research methods*, 4.th edn, Oxford Univ. Press, Oxford.

Burgelman, R. A. (1983). Corporate entrepreneurship and strategic management: Insights from a process study. *Management science*, 29(12), 1349-1364.

Burkacky, O., Deichmann, J., Doll, G., & Knochenhauer, C. (2018). *Rethinking car software and electronics architecture*. McKinsey & Company.

Calantone, R., Di Benedetto, A. & Schmidt, J. (1999). Using the analytical hierarchy process in new product screening. *Journal of Product Innovation Management*, vol 16, pp. 65-76.

Carbonell-Foulquie, P., Munuera-Aleman, J. L. & Rodriguez Escudero, A.I. (2004). Criteria employed for go/no-go decisions when developing successful highly innovative products. *Industrial Marketing Management*, vol. 33(4), pp. 307–316

Chang, T., Pao Yeh, S., & Yeh, I. J. (2007). The effects of joint reward system in new product development. *International Journal of Manpower*

Chen, C. (2017). A quality management approach to guide the executive management team through the product/service innovation process. *Total quality management & business excellence*, 17(03), ss. 1-20

Chenhall, R.H. (2003). Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28 (2–3), ss. 127–168.

Chiesa, V. Frattini, L. Lamberti, L. & Noci, G. (2009). Exploring management control in radical innovation projects. *European Journal of Innovation Management*, 12 (4), ss. 416– 443.

Choi, H. S., & Thompson, L. (2005). Old wine in a new bottle: Impact of membership change on group creativity. *Organizational Behavior and human decision processes*, 98(2), 121-132.

Cooper, R., Edgett, S. & Kleinschmidt, E. (1997). Portfolio management in new product development: Lessons from the leaders. *Research Technology Management*, vol 40, pp. 16–28.

Cooper, R. & Kleinschmidt, E. (1995). Benchmarking firms' new product performance and practices. *IEEE Engineering Management Review*, vol. 23(3). pp. 112-120.

Cozijnsen, A.J. Vrakking, W.J. & van Ijzerloo, M. (2000). Success and failure of 50 innovation projects in Dutch companies. *European Journal of Innovation Management*, 3(3), ss. 150-159

Christensen, C.M. (1997). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston: Harvard Business School Press.

Crossan, M.M., Lane, H.W. & White, R.E. (1999). An organizational learning framework: from intuition to institution. *Academy of Management Review*, vol. 24, pp. 522–537.

Daher, N. (2016). The relationships between organizational culture and organizational innovation. *International Journal of Business and Public Administration (IJBPA)*, 13(2), ss. 1-15.

Damanpour, F. (1991). Organizational Innovation: A Meta-Analysis of Effects of Determinants and Moderators. *The Academy of Management Journal*, 34(3), ss. 555-590.

Denscombe, M. (2009). *Forskningshandboken: för småskaliga forskningsprojekt inom samhällsvetenskaperna*. 2.ed., Lund: Studentlitteratur

Denscombe, M. (2009). *Forskningshandboken: för småskaliga forskningsprojekt inom samhällsvetenskaperna*. 2. uppl., Lund: Studentlitteratur

Denscombe, M. (2010). *The Good Research Guide: For Small-scale Social Research Projects (Open UP Study Skills)*. McGraw-Hill.

Dess, G. G., & Picken, J. C. (2000). Changing roles: leadership in the 21st century, *Organizational Dynamics*, vol. 28, pp. 18–34

Dougherty, D. (1992). Interpretive Barriers to Successful Product Innovation in Large Firms. *Organization Science*, 3(2), ss. 179-202.

Economist (2011). Innovate or die, Available Online: <https://www.economist.com/node/242082> [Accessed 20 April 2019]

Eriksson, L. T. & Wiedersheim-Paul, F. (2008). *Rapportboken*. Liber

Feng, S., & Zhang, C. (1998). A modular architecture for rapid development of CAPP systems for agile manufacturing. *IIE transactions*, 30 (10), pp. 893-903.

Fernez-Walch, S. (2017). *The Multiple Faces of Innovation Project Management*. London: ISTE Ltd.

Foster, R. (2012). Creative destruction whips through corporate America. *Innosight Executive Briefing*



Frishammar, J., Floren, H. & Wincent, J. (2011). Beyond managing uncertainty: insights from studying equivocality in the fuzzy front end of product and process innovation projects. *IEEE Transactions on Engineering Management*, vol. 58, pp. 551–563.

Floren, H., Frishammar, J., Parida, V. & Wincent, J (2017). Critical success factors in early new product development: a review and a conceptual model. *International Entrepreneurial Management Journal*. Vol 14, p. 411-427. DOI 10.1007/s11365-017-0458-3

Gassmann, O. & Schweitzer, F. (2014). *Management of the Fuzzy Front End of Innovation*. Springer: New York

Geels, F. (2012). A socio-technical analysis of low-carbon transitions: introducing the multi-level perspective into transport studies. *Journal of transport geography*, 24, pp. 471-482.

Goffin, K. & Mithell, R. (2016). *Innovation Management – Effective Strategy & Implementation*. Red Globe Press: London.

Graneheim, U.H. & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*

Griffin, A. & Page, A.L. (1996). PDMA success measurement project: recommended measures for product development success and failure. *Journal of Product Innovation Management*, vol. 13, pp. 478–496.

Gupta, A., Tesluk, P. & Taylor, S. (2007). Innovation At and Across Multiple Levels of Analysis. *Organization Science*, vol. 18, pp. 885-197.

Hall, D. & Nauda, A. (1990). An interactive approach for selecting IR&D projects. *IEEE Transactions on Engineering Management*, vol. 37(2), pp. 126–33.

Hagn, C., & Werner, A. (2018). Organizational Ambidexterity as a Catalyst for Radical Innovation: From ‘just’ another car manufacturer to a digital mobility provider. Lund University, School of Economics and Management

Hansen, T.C. & Andreasen, M.M. (2005). On the Content of a Product Idea. *International Conference on Engineering Design*, Melbourne, Australia 15-18, August 2005, pp. 182-183.

Hart, S., Hultink, E.J., Tzokas, N. & Commandeur, H.R. (2003). Industrial companies' evaluation criteria in new product development gates. *Journal of Product Innovation Management*, vol. 20(1), pp. 22–36.

Harper, S. C. & Porter, T. W. (2011). Innovate or die – Unless you identify and act upon opportunity, your company will be chewed up by the competition, *Industrial Engineer*, vol.43, no.9

Hedlund, M.L. & Johansson, C. (2010). *Idea Management at Volvo IT – Improving the Front End of Innovation*. Master Thesis, Department of Technology Management and Economics. Gothenburg: Chalmers University of Technology.

Hirst, P., Thompson, G., & Bromley, S. (2015). *Globalization in question*. New Jersey: John Wiley & Sons.

Holahan, P.J., Sullivan, Z.Z. & Markham, S.K. (2014). Product Development as Core Competence: How Formal Product Development Practices Differ for Radical, More Innovative, and Incremental Product Innovations. *Journal of Product Innovation Management*, vol. 31(2), pp. 329-345.

Holme, I. M., & Solvang B. K. (1991). *Forskningsmetodik – Om kvalitativa och kvantitativa metoder*. Lund, Sverige: Studentlitteratur.

Jacobsson, T. (2010). *Implementering av processlösningar i sjukvården*. Department of Technology Management and Economics Operation Management, Gothenburg: Chalmers University of Technology.

Jacobsen, D. I. (2002). *Vad, hur och varför? – Om metodval i företagsekonomi och andra samhällsvetenskapliga ämnen*. Lund: Studentlitteratur

Kathoefer, D. G., & Leker, J. (2012). Knowledge transfer in academia: an exploratory study on the Not-Invented-Here Syndrome. *The Journal of Technology Transfer*, 37(5), 658-675

Khurana, A. & Rosenthal, S.R. (1997). Integrating the fuzzy Front End of new product development. *Sloan Management Review*, vol. 38, pp. 103-120.

Kim, J. & Wilemon, D. (2002). Focusing the fuzzy front–end in new product development. *R&D Management*, vol. 32(4), pp. 269–279.

Kleinschmidt, E., de Brentani, U. & Salomo, S. (2007). Performance of Global New Product Development Programs: A Resource-Based View. *Journal of Product Innovation Management*, vol. 24(5), pp. 419-441.

Koen, P., Ajamian, G., Burkart, R., Clamen, A., Fisher, E., Fountoulakis, S., Johnson, A., Puri, P. & Seibert, R. (2002). Fuzzy front end: Effective methods, tools, and techniques. In Bellivieu, P., Griffin, A. & Somermeyer, S. (ed.) *The PDMA Toolbook for New Product Development*. New York: John Wiley, pp. 5-35.

Koen, P., Ajamian, G., Burkart, R., Clamen, A., Davidson, J., D'Amore, R., Elkins, C., Herald, K., Incorvia, M., Johnson, A., Karol, R., Seibert, R., Slavejkov, A. & Wagner, K. (2001). Providing Clarity and A Common Language to the “Fuzzy Front End”. *Research - Technology Management*, vol. 44(2), pp. 46-55.

Kurkkio, M. (2010). *Managing the Fuzzy Fron End of Product and Process Development: Case Studies of Process Firms*. Diss. Luleå: Luleå University of Technology.

Lane, D.A. & Maxfield, R.R. (2005). Ontological uncertainty and innovation. *Journal of Evolutionary Economics*, vol. 15, pp. 3-30.

Lekvall, P., & Wahlbin, C. (1993). *Information för marknadsföringsbeslut*. Göteborg: IHM förlag AB.

Levinthal, D. & March, J. (1993). The myopia of learning, *Strategic Management Journal*, vol.14, no.2, pp.95-112

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills: Sage.

Lorenz, R. (2010) What is innovation? Insights and perspectives on the term “innovation”. *Technology Intelligence and Planning*, vol. 6, pp. 63-75.

Magnusson, M. & Martini, A. (2008). Dual organizational capabilities: from theory to practice – the next challenge for continuous innovation. *International Journal of Technology Management*, vol. 42, pp. 1-19.

March, J. (1991). Exploration and Exploitation in organizational learning, *Organization Science*, vol.2, pp.71-87

Markham, S.K. (2013). The impact of front-end innovation activities on product performance. *Journal of Product Innovation Management*, vol. 30, pp. 77–92.

Martinsuo, M. & Poskela, J. (2011). Use of evaluation criteria and innovation performance in the front end of innovation. *Journal of Product Innovation Management*, vol. 28, pp. 896–914.

Martins, E. C., & Terblanche, F. (2003). Building organisational culture that stimulates creativity and innovation. *European journal of innovation management*, 6(1), 64-74.

McKinsey & Company. (2016). Automotive revolution - perspective towards 2030: How the convergence of disruptive technology-driven trends could transform the auto industry

Morgan, G. (2006). Images of organization. Updated uppl., Thousand Oaks: Sage Publications

Merchant, K.A. & Van der Stede, W. (2012). *Management Control Systems: Performance Measurement, Evaluation and Incentives*. London: Pearson, Education Limited.

Miles, M.B., & Huberman, A.M. (1994). *Qualitative Data Analysis*. Thousand Oaks: Sage Publications.

Moenaert, R.K., Souder, W.E., De Meyer, A. & Deschoolmeester, D. (1994). R&D-marketing integration mechanisms, communication flows, and innovation success. *Journal of Product Innovation Management*, vol. 11(1), pp. 31-45.

Moos, B., Beimborn, D., Wagner, H.T. & Weitzel, T. (2013). The role of knowledge management systems for innovation: An absorptive capacity perspective. *International Journal of Innovation Management*, vol. 17, pp. 1-31.

Nelson, G. (2014). SETTLING INTO SILICON VALLEY; auto industry makes stake in computers clear. *Automotive News*, 88(6625), 30.

Nilsson, S. (2015). *Making innovation everyone's business: Using routines and controls*. Diss. Stockholm: Royal Institute of Technology.

Nobelius, D. & Trygg, L. (2002). Stop chasing the front end – management of the early phases in product development projects. *International Journal of Project Management*, vol. 20(5), pp. 331-340.

O'Connor, G. (2008). Major innovation as a Dynamic Capability: A Systems Approach. *Product Innovation Management*, vol. 25, pp. 313-330.

O'Reilly, C.A. & Tushman, M.L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behaviour*, vol. 28, pp. 185-206.

O'Reilly, C. A. & Tushman, M. L. (2013). Organizational Ambidexterity: Past, Present, and Future, *The Academy of Management Perspectives*, vol.27, no.4, pp.324-338

Pattersonson, L. (2017). Why do Apple and Google want in on the Automotive industry?. *Home Business*, 5 July. <https://homebusinessmag.com/businesses/special-types/apple-google-want-automotive-industry/> [Accessed 20 April 2019]

Patel, R., & Davidson, B. (2003). *Forskningsmetodikens grunder*. Lund: Studentlitteratur.

Rafinejad, D. (2007). *Innovation, Product Development and Commercialization – Case Studies and Key Practices for Market Leadership*. Fort Lauderdale: J. Ross Publishing.

Reid, S. & Brentani, U. (2004). The Fuzzy Front End of New Product Development for Discontinuous Innovations: A Theoretical Model. *Journal of Product Innovation Management*, vol. 21, pp. 170-184.

Remenyi, D., Williams, B., Money A., and Swartz, E. (1998) *Doing research in business and management: an introduction to process and method*, SAGE, London

Riel, A., Neuman, M. & Tichkiewitch, S. (2013). Structuring the early fuzzy front-end to manage ideation for new product development. *CIRP Annals – Manufacturing technology*, vol. 62, pp. 107-110.

Rienecker, L. & Stray-Jørgensen, P. (2004). *Att skriva en bra uppsats*. Malmö: Liber.

Robson, C. (2002). *Real world research*. Malden, Mass.: Blackwell.

Ryen, A. (2004). *Kvalitativ intervju*. Malmö, Sverige: Liber AB.

Saleh, S. D., & Wang, C. K. (1993). The management of innovation: strategy, structure, and organizational climate. *IEEE transactions on engineering management*, 40(1), 14-21.

Saunders, M., Lewis, P. & Thornhill, A. (2009). *Research methods for business students*. 5th ed. Harlow: Pearson Education Limited.

Schumpeter, J.A. (1935). *The theory of economic development: an inquire into profits, capital, credit, interest and the business cycle*. Boston: Harvard economic studies

Schulze, A., Paul MacDuffie, J., & Taube, F. A. (2015). Introduction: Knowledge generation and innovation diffusion in the global automotive industry-change and stability during turbulent times. *Industrial and Corporate Change*, 24(3), 603-611. doi:10.1093/icc/dtv015

Silverman, D. (2016). *Qualitative Research*, 4th edn, SAGE

Smith, P.G. & Reinertsen, D.G. (1991). *Developing products in half the time*. New York: Van Nostrand Reinhold Book.

Stevens, E (2014). Fuzzy front-end learning strategies: Exploration of a high-tech company. *Technovation*, vol. 34, pp. 431-330.

Strecker, N. (2007). *Innovation Strategy and Firm Performance – An empirical study on publicly listed firms*. 1.ed., Weisbaden: Gabler

Song, X. M., Neeley, S. M., & Zhao, Y. (1996). Managing R&D-marketing integration in the new product development process. *Industrial Market Management*.

Souder, W. E. (1981). Disharmony between R&D and marketing. *Industrial Marketing Management*, 10 (1), 67-73

Sundbo, J. (1996). The balancing of empowerment - A strategic resource-based model of organizing innovation activities in service and low-tech firms. *Technovation*, 16(8), ss. 397-409

Teece, D. J., Pisano, G. & Shuen, A. (1997). Dynamic capabilities and strategic management, *Strategic Management Journal*, vol. 18, pp.509-533

Thanasopon, B., Papadopoulos, T. & Vidgen, R. (2015). The role of openness in the fuzzy front-end of service innovation. *Technovation*, vol. 47, pp. 32-46

Trost, J. (2001). *Enkätboken*. Lund: Studentlitteratur.

Turner, R., Ledwith, A., Kelly, J., 2012. Project management in small to medium-sized enterprises: tailoring the practices to the size of company. *Management Decision*, 50(5), pp.942- 957

Tushman, M. L., Smith, W. K., & Binns, A. (2011). The Ambidextrous CEO. *Harvard Business Review*

Tushman, M. L. & O'Reilly, C. A. (1996). Ambidextrous organizations: managing evolutionary and revolutionary change, *California Management Review*, vol.38, pp. 8–30

Van de Ven, A.H. (1986). Central problems in the management of innovation. *Management Science*, vol. 32, pp. 590-607.

Van Riel, A.C., Lemmink, J. & Ouwersloot, H. (2004). High-technology service innovation success: A decision-making perspective. *Journal of Innovation Management*, vol. 21, pp. 348–359.

Verworn, B. (2009). A structural equation model of the impact of the “fuzzy front end” on the success of new product development. *Research Policy*, vol. 38, pp. 1571–1581.

Verworn, B., Herstatt, C. & Nagahira, A. (2008). The fuzzy front end of Japanese new product development projects: impact on success and differences between incremental and radical projects. *R&D Management*, vol. 38(1), pp. 1–9.

Veryzer, Jr. R.W. (1998). Discontinuous innovation and the new product development. *Journal product innovation management*, vol. 15, pp. 304-321.

Vetenskapsrådet. (2017). *Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning*. Stockholm: Vetenskapsrådet.

de Visser, M., de Weerd-Nederhof, P., Faems, D., Song, M., Looy, B. & Visscher, K. (2010). Structural ambidexterity in NPD processes: A firm-level assessment of the impact of differentiated structures on innovation performance. *Technovation*, vol. 30(5-6), pp. 291-299.

Voss, C., Tsikriktsis, N., & Frohlich, M. (2002). Case research in operations management. *International journal of operations & production management*, 22 (2), pp. 195-219.

Wall, M. (2014). Innovate or die: The stark message for big business, BBC News, 5 September, Available Online: <http://www.bbc.com/news/business-28865268> [Accessed 20 April 2019]

Wallén, G. (1996). *Vetenskapsteori och forskningsansats*. Lund: Studentlitteratur.

West, M. A. (2003). Innovation implementation in work teams. I Nijstad, B.A. & Paulus, P.B. (red.) *Group Creativity Innovation through Collaboration*. New York: Oxford University Press Inc., ss. 245-276.

Wu, A. Wang, Z. & Chen, S. (2017). Impact of specific investments, governance mechanisms and behaviors on the performance of cooperative innovation projects. *International Journal of Project Management*, 35(3), ss. 504-515.

Wheelwright, S. & Clark, K. (1992). *Revolutionizing Product Development – Quantum Leaps in Speed, Efficiency, and Quality*. The Free Press: New York.



Wycoff, J. (2003). The "big 10" innovation killers: How to keep your innovation system alive and well. *The Journal for Quality and Participation*, vol. 26(2), pp. 17-21.

Ylinen, M. & Gullkvist, B. (2014). The effects of organic and mechanistic control in exploratory and exploitative innovations. *Management Accounting Research*, 25(1), ss. 93-112.

Yin, R. K. (1984). *Case Study Research: Design and methods*. Thousand Oaks: Sage Publications.

Yin, R.K. (2003). *Case Study research: design and methods*, 3rd edn, Thousand Oaks: Sage Publications

Yin, R. K. (2013). *Kvalitativ forskning från start till mål*. 1. uppl., Lund: Studentlitteratur

Yin, R. K. (2014). *Case Study Research - Design and Methods*. 5 red. Thousand Oaks, CA: SAGE Publications.

Åhlström, P. & Karlsson, C. (2009). *Longitudinal Field Studies*, in Karlsson, C. (Red.) *Researching Operations Management*, New York: Routledge, 196-235.