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Master Degree Project in Innovation and Industrial Management

Triggering Radical Process Innovation

Process innovation at operational manufacturing division

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Triggering Radical Process Innovation
- Innovation Manufacturing Processes at Operational Manufacturing Division

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ABSTRACT

Innovation is mostly associated with product innovation; leaving process innovation in the shadows. Firms in general have less explicitly defined tools and methods for process innovation. Process innovation is important, and firms should pay attention to it and focus on the triggering phase, as it is where the possibility to impact is greatest. The purpose of this case study is to explore the triggering of manufacturing process innovation at Operational Manufacturing Division (OMD) by identifying activities and success factors. The thesis results in decreasing the gap between product and process innovation. Findings show several different activities to utilize, and discovers a challenge for firms to determine the most suitable activities for every unique situation. The case study also identifies four managerial paradoxes firms must consider to trigger innovation in a beneficial manner. The forth paradox emerged from this thesis and highlights the trade-off around how many activities a firm should utilize for each unique situation. The paradoxes reach beyond a simple process and provide OMD with recommendations for how to trigger radical process innovations in a better way with support from the Decision Tree framework. In turn, the Decision Tree framework facilitates the process of deciding which and how many activities to utilize when triggering radical process innovation.

Keywords: *Process Innovation, Innovation Process, Radical Innovation, Idea Generation, Decision Tree*

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1 INTRODUCTION

The introduction chapter aims to provide the background for this thesis. It introduces the project topic, and project sponsor – Operational Manufacturing Division (OMD)[1]. Subsequently, the thesis explains the purpose, research questions, delimitations, and thesis disposition accordingly.

1.1 BACKGROUND

Today, the buzzword 'innovation' is constantly reoccurring in news, research, and other. Innovation has become something all companies must consider in order to remain or become competitive (Davenport, 2013; Dodgson, Gann, & Salter, 2008; Hill & Jones, 2014). Good ideas can develop into innovations in products and processes. Product innovation is the development of products or systems that are new to the world, or consists of minor incremental or major adaptations. In essence, product innovation changes what firms offer to its customers (Dodgson et al., 2008; Hill & Jones, 2014). Examples of previous product and service innovations are Tesla's electric car and online retailing (Tidd & Bessant, 2014). In contrast, Tidd and Bessant (2014) describe process innovation as changes in the way firms create and deliver products and services. In other words, process innovation is improving operational procedures, forming new production techniques as well as new firm specific routines (Bessant & Francis, 2005). An example of process innovation is the lean manufacturing system, revolutionizing the way firms produce goods (Dodgson et al., 2008).

It is interesting to note that innovation has been mostly associated with product innovation, giving reason to further investigate process innovation (Davenport, 2013; Reichstein & Salter, 2006). In addition, it appears that firms in general have less explicitly defined tools and methods for process innovation than product and service innovation (Reichstein & Salter, 2006). Nevertheless, Utterback and Abernathy (1975) argue for the importance of capturing the dynamics of both product and process innovation, as they are equally significant for business. Similarly, Reichstein and Salter (2006) argue process innovation is indeed important for firms' productivity improvement, industrial change, and competitive advantage. Therefore, firms should also pay attention to process innovation.

Although businesses today prioritize innovation as they consider it to enhance competitive advantage, it is difficult to acquire (Dodgson et al., 2008). Therefore, successful innovation management is vital and required for converting good ideas to innovations. However, a challenge with innovation management is organizing it in a structured manner. If innovation management is unstructured and fails, the company could suffer severe consequences such as losing money, workers, and a loss of reputation. On the contrary, if innovation management is well structured and done right, the company could create value, enhance profit, gain

[1] OMD is a fictive name of a division operating within a large industrial company. Both will be anonymous and the thesis excludes company and organization specific details.

sustainable competitive advantage, and become an employer of choice (Dodgson et al., 2008). An additional challenge with innovation management is prioritizing both product and manufacturing process innovations; if innovating firms solely focus on product innovation and not process innovation, they might fail (Teece, 1986). The reasoning for this is the classical theory of balance between exploration and exploitation; without exploiting processes, firms could eventually be left with the costs of exploration and innovation, and without any of its benefits (March, 1991). Hence, by focusing on manufacturing process innovation, and not only innovating core products and services, companies could achieve further competitive advantage (Dodgson et al., 2008; Lindsay, Downs & Lunn, 2003).

In general, firms often manage and develop innovations utilizing an innovation process as a facilitating tool, to transfer new ideas to innovations (Bessant, Möslein, Neyer, Piller, & von Stamm, 2009). Every phase within the innovation process is important; however, the first triggering phase of the innovation process will define the quality and progress of the future innovations (Tidd & Bessant, 2014). By focusing on the triggering phase firms increase the opportunities to find innovation. Without the initial idea, there is no need for the latter phases in an innovation process - as there is nothing to develop. In addition, Herstatt and Verworn (2001) argue for the first phase to have higher impact on the entire process and its results, than the subsequent phases partly because it has a large effect on the total cost. Figure 1 shows that organizations have high influence and low costs early in the innovation process. Similarly, Cooper and Kleinschmidt (1993) state, the quality of execution of pre-development activities determined whether the projects were successful or failed. Additionally, the first phase is also the most difficult to structure in order to operate in an efficient manner, both in theory and in practice (Herstatt & Verworn, 2001).

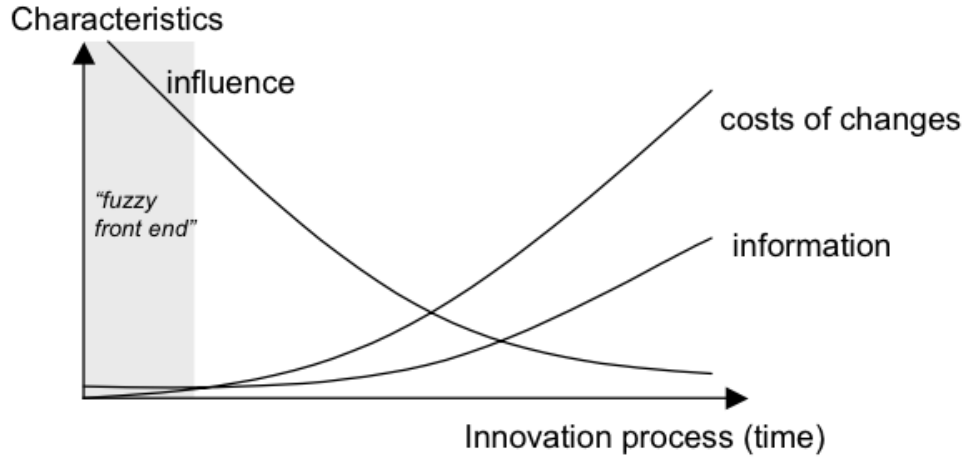

Figure 1: The Fuzzy Front end of Innovation (Herstatt & Verworn, 2001)

The evolvement of the processes can emerge through different degrees, namely radical or incremental process innovation (Davenport, 2013). According to Reichstein and Salter (2006), there are many definitions and sometimes contradictions between the two different degrees. To distinguish between the two, incremental process innovation focuses on increasing efficiency and effectiveness in already existing processes through process optimization, waste reduction utilizing lean, six sigma and other well researched process improvement concepts

(Davenport, 2013; Hammer, 2004). In contrast, radical process innovations can significantly change the way firms run their operations through enhanced productivity, quality, and changes the process routes (Tidd & Bessant, 2014). For example, changes in Toyota's production systems enabled the firm to increase efficiency and reduce waste; in turn, it revolutionized its process route (Tidd & Bessant, 2014). Consequently, radical process innovation concerns the degree of novelty of an innovation to the industry itself (Dodgson et al., 2008; Ettlie, Bridges & O'Keefe, 1984; Reichstein & Salter, 2006).

Moreover, product innovation today receives higher attention than process innovation (Davenport, 2013; Riechstein & Salter, 2006). Exploring existing theory and practices around product innovation, and combining it with limited theory and empirical data for process innovation provide a new approach to the research area. Hence, applying product innovation theories provides guidelines for how to manage process innovation in the early phases of the innovation process. In turn, the thesis contributes to closing this gap in literature and provides new insight in the subject of process innovation.

1.2 PROBLEM

A multinational, industrial division struggling with radical manufacturing process innovation is OMD. Historically, OMD committed fewer resources to manufacturing process innovation than to product innovation, meaning few actions taken in regards to process innovation. Today, OMD has made some efforts to facilitate process innovation; however there is no explicit or systematic process for process innovation. Instead, OMD want to be proactive rather than reactive when approaching process innovation, in order to influence at relatively low costs, as illustrated in Figure 1. To emphasize, OMD do not exploit its full potential. OMD highlighted the significance of radical process innovation and expressed concerns about how they *"can generate, capture, and motivate new ideas in a more efficient manner"* (OMD, Presentation, 2014). OMD explicitly articulated the importance of triggering radical process innovations, as its activities today are limited or even non-existent. For example, OMD has pursued several radical manufacturing innovations in the last decade. However, the challenge lies in repeatedly triggering radical ideas. OMD further stresses the need to not lose emerging ideas and innovations by overlooking opportunities. OMD expressed the search phase activities to be difficult yet vital for successful innovations. To emphasize, the identified challenge for OMD lies within structuring and managing the triggering phase for radical process innovation.

1.3 PURPOSE

The purpose and project aim suggested by OMD is to identify how to trigger ideas concerning radical manufacturing process innovation. The purpose for conducting this research is to get a comprehensive view of OMD's work within the first phase of radical process innovation. To contribute to OMD and the gap in theory, the study maps out current projects to identify

various succeeded or failed radical projects. The research identifies elements of the triggering phase and provides in-depth understanding of the current work in idea generation for process innovation. To add further value to the research, sub-purposes identify main activities and success factors. The main activities are the activities within the innovation process vital for triggering ideas according to the theoretical framework and empirical data. For the main activities to be successful, success factors are important to manage to ensure high levels of idea generation.

1.4 RESEARCH QUESTION

Conclusions from the discussion above resulted in the following research question and sub-questions:

How should OMD trigger radical process innovation within manufacturing?

This question explores the current ways for innovating manufacturing processes. To gain deeper understanding of OMD's precise conditions, the sub-questions, focusing the different steps of the company's innovation process guides the research:

- *What are the main activities for triggering radical process innovation?*

- *What are the success factors for triggering radical process innovation?*

1.5 DELIMITATIONS

Due to time constraints, this thesis does not investigate how to manage all steps of the process. Rather it provides a framework for the structure for OMD's triggering of the process, leaving out strategic choice and implementation. In addition, this thesis focuses entirely on radical manufacturing process innovation, excluding incremental process innovation, as the latter is more similar to process improvement, which appears extensively in research. Numerous authors such as Amabile (1997) cover creativity techniques within the first phase, therefore this thesis does not cover creativity for the activities. To emphasize, the thesis focuses on the first phase for radical process innovation within manufacturing. Moreover, it investigates OMD by interviewing and observing managers and employees. Hence, the thesis obtains OMD's internal perceptions of the innovation process, making the research subjective, and consequently limiting the possibility to generalize the results.

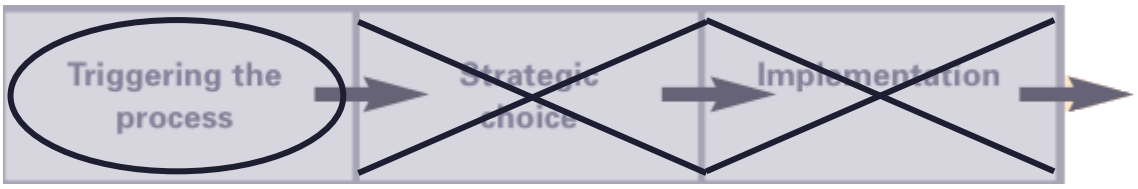

Figure 2: Bessant & Francis, the Model for Discontinuous Innovation (2005)

1.6 THESIS DISPOSITION

Figure 3 outlines the thesis' disposition by stating each headline and explaining the content of each. This is to provide a better overview and holistic picture of the thesis' basic structure.

Introduction	•Introducing background, problem, purpose, research quesstion, and delimitation
Methodology/Method	•Research approach, design, method, data collection, data analysis, and research quality
Theoretical Freamework	•Defining the fundamentals •Activities and Success Factors for the Triggering phase •Managerial Paradoxes
Empirical Findings	•OMD Case
Analysis	•Incorporate theory with empirical findings for analysis •Discussion
Conclusion	•Recommendations •Future Research

Figure 3: Authors' Thesis Disposition

2 THEORETICAL FRAMEWORK

The purpose of the theoretical framework chapter is to outline relevant theory the study of this thesis build on. The chapter starts with discussing the broader scope of process innovation and innovation processes. Next is the triggering phase, defining the main activities and success factors.

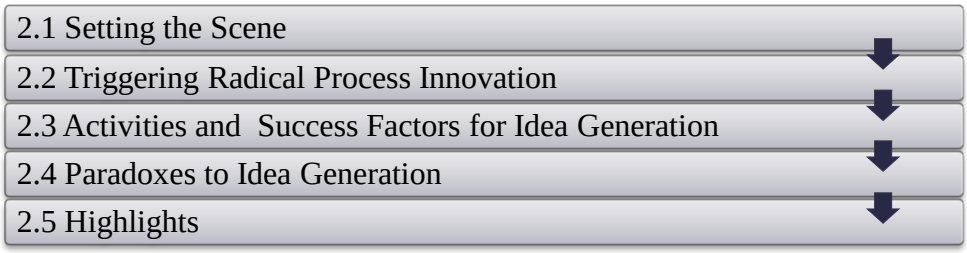

Figure 4: Outline of the Theoretical Framework

2.1 SETTING THE SCENE

2.1.1 PROCESS INNOVATION

Utterback and Abernathy (1975) developed a well-regarded complementary model by discovering a relationship between innovation and manufacturing process characteristics. In fact, the essentials of the relationship are that the characteristics of a firm's innovation correspond with the stage of development in the manufacturing process, and the competitive strategy and growth. The correlation between the development phase, and strategy and growth also displays consistent patterns in what type of innovations firms perform in terms of products or process innovation (Utterback & Abernathy, 1975). Similarly, the Product Life Cycle (PLC), specifying the maturity of an innovation, can facilitate innovation management (Dodgson et al., 2008).

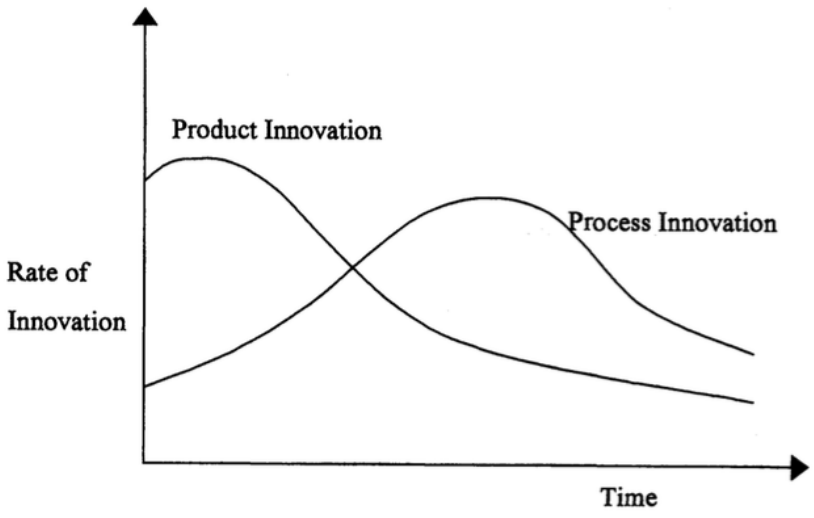

Figure 5, PLC, (Utterback & Abernathy, 1975)

To elaborate, a new industry often has its manufacturing concentrated closely to its customers and sources of innovation (Dodgson et al., 2008). On the contrary, as the industry matures, manufacturing becomes more standardized and the presence of the innovation sources becomes less vital. In addition, mature industries, with more standardized products and less possibility to radically change the products, require technology development, cost cutting, and scale maximizing in order to stay competitive (Dodgson et al., 2008). The proportion of process innovation would be small in the early stages of the PLC, while it would be predominant in the subsequent, mature stages (Utterback & Abernathy, 1975). Similarly, large firms are process innovators to a higher degree than small (Reichstein & Salter, 2006). In essence, there is a tendency for processes or manufacturing to evolve over time. Therefore, large incumbent firms should value the opportunities existing in process innovation (Utterback & Abernathy, 1975).

2.1.2 THE INNOVATION PROCESS

Innovation process might sound similar to process innovation. However, the two refer to different practices. Process innovation concerns innovation of processes, as opposed to the innovation process, which is a series of routines and activities utilized for process or product innovation (Dodgson et al., 2008). The innovation process should facilitate innovation evolving beyond ad hoc ways of focusing on 'doing differently' (Tidd & Bessant, 2014). Moreover, viewing innovation as a process is important as this apprehension changes the basic management of it (Tidd & Bessant, 2014). By viewing innovation as a process, the actions performed take shape accordingly; the mindset affects how the innovations receive attention, how individuals allocate resources, and the decision making involved (Tidd & Bessant, 2014). Hence, to reduce uncertainty around innovation, the innovation process must have a clear and common understanding about what the process entails, and how it operates.

Bessant and Francis (2005) suggest a basic structure for the innovation process, containing the fundamental phases of triggering the process, strategic choices, and implementation. In turn, contingencies and other firm specific circumstances will affect these three phases. Viewing the process as completely linear is not optimal for radical process innovation, as it needs flexibility and an iterative approach (Herstatt & Verworn, 2001). The innovation process offers an underlying structure with sequential logic, however opens up possibilities to stop at different phases, go sideways, or to go back-and-forth between them (Tidd & Bessant, 2014). Thus, it is possible to think of the innovation process as a simple map with clear phases, however; the process is much more complex in reality.

2.1.3 THE IMPORTANCE OF TRIGGERING THE PROCESS

Herstatt and Verworn (2001) explain that the first phase, triggering the process, contains idea generation. The first phase involves high levels of freedom to influence projects at a lower

cost. Subsequently, as shown in figure 1, the further projects progress in the innovation process, the more expensive and difficult changes and adoptions become (Herstatt & Verworn, 2001). Therefore, it is important for firms to identify the gaps in information and knowledge early on.

According to Bessant and Francis (2005), companies should be aware of the need to develop good innovation routines to be able to deal with periods of radical change. During turbulent periods, firms must consider 'doing things differently' rather than 'doing the same things better'. In addition, the ability for incumbent firms successful in innovation might hamper the pursuit of deploying radical innovation routines. In turn, these radical innovation routines should enable firms to detect, deal and exploit radical change and mitigate the risk of them to overlook market-changing opportunities (Bessant & Francis, 2005).

2.2 TRIGGERING RADICAL PROCESS INNOVATION

2.2.1 WHERE DO IDEAS COME FROM?

Companies would benefit from considering additional actions in order to manage radical innovation in a good manner (Bessant & Francis, 2005). To exemplify, they should extend their peripheral vision and bring in outside perspectives, by discovering the outer edge of markets, existing technologies, and corporate activity. Adapting a peripheral vision and extending the search for new ideas to beyond business as usual can help finding new opportunities and innovations (Tidd & Bessant, 2014). In addition, firms should make sure they do not automatically sift away radical, innovative ways of working (Bessant & Tidd, 2005). Firms can also develop scenario analyses to obtain and in turn use these plans to explore alternative futures and scenarios. Bessant and Francis (2005) further argue that firms succeeding in developing incremental and radical innovations in tandem will have a significant advantage over those who do not. Hence, by managing the idea generation process thoroughly, firms can ensure systematic and high involvement in innovation.

Innovations do not necessarily occur by chance or through a moment of "eureka" (Tidd & Bessant, 2014). Likewise, triggering the innovation process is not solely about occasional flashes of inspiration; firms can look for innovations in other directions as well (Tidd & Bessant, 2014). Innovations can emerge from taking thoughts forward, revising and refining them, or braiding together different aspects of knowledge towards a beneficial process. In fact, Drucker (2002) argue most innovations evolve from searching consciously and purposefully.

The complexity surrounding idea generation management provides incentive for firms to monitor it effectively (Björk et al., 2010). Much research in idea generation highlights creativity, and researchers argue that individual employees and groups produce a large portion of ideas (Björk, Boccardelli & Magnusson, 2010). Further, Björk et al., (2010) emphasize an increasing trend of firms searching for ideas outside the firm's boundaries. To emphasize,

innovations emerge from a wide range of incentives, featured in Figure 6 by Tidd and Bessant (2014).

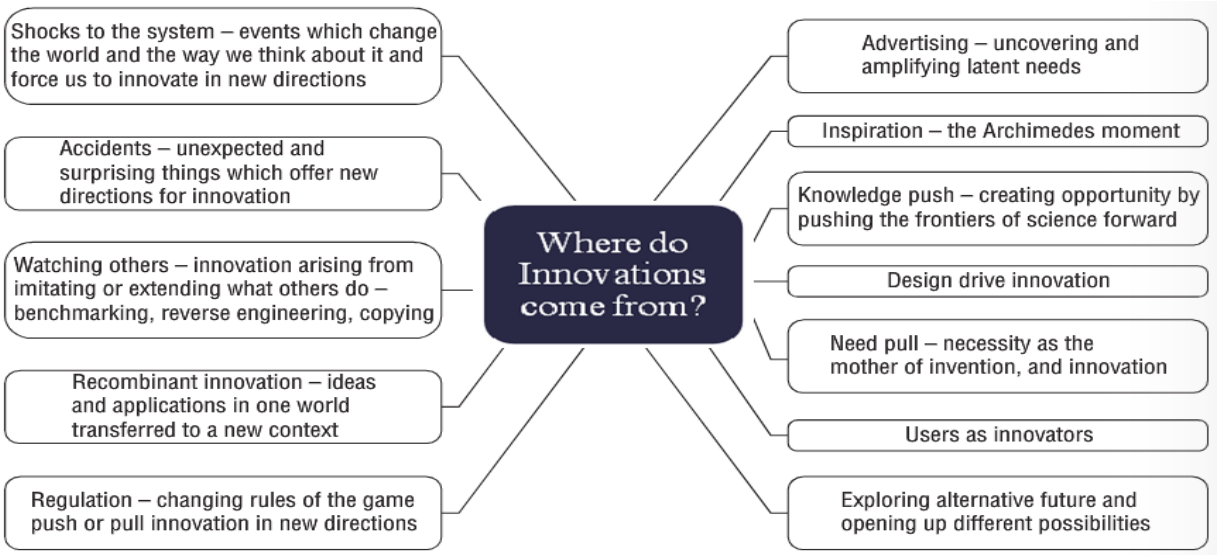

Figure 6: Where do Innovations come from? (Tidd & Bessant, 2014)

Moreover, if firms can manage to understand the various sources of innovation, they can dramatically improve their innovation efforts (Dodgson et al., 2008). One strategic touch-point concerning nontraditional sources of innovation relates to details and information about how firms utilize their awareness of innovation sources. According to Tidd and Bessant (2014) firms can have different approaches for obtaining ideas. Triggers for innovation require additional activities to grasp opportunities for emergent ideas, including external and internal benchmarking, and recombinant innovation. Boeddrich (2004) further develops this line of thought by stating that all innovations emerge from ideas generated individually or in groups, through creative or rational thinking of employees, customers, suppliers or universities. Further, regulations, accidents, and shocks to the system can also serve as triggers, setting the innovation process in motion (Tidd & Bessant, 2014). Hence, it is important to be aware of these uncontrollable factors as well and acknowledge the opportunities for innovation. Firms can also tap into new areas of innovation by exploring future trajectories and securing tools and methods for search (Tidd & Bessant, 2014). Chapter 2.3 discusses these innovation-triggering activities more in detail.

2.3 ACTIVITIES AND SUCCESS FACTORS FOR IDEA GENERATION

There are different approaches a firm can undertake when organizing and managing the initial innovation phase. It ranges from everything between enabling and structuring the organizational culture to being open to innovative opportunities, and balancing between

control and autonomy (Davenport, 2013; Dodgson et al., 2008; Tidd & Bessant, 2014). As idea generation is of utmost importance, and as Tidd and Bessant (2014) claim people are firms' greatest assets for idea generation, most innovation activities and tools involves people. Today there are numbers of high-tech solutions, designed to help organizations generate and develop new ideas (Bessant & Tidd, 2007). However, less advanced methods are equally important and beneficial, and various methods might work differently for different firms. Hence, firms can benefit from balancing between best practice and internal methods (Bessant & Tidd, 2007). Common tools for idea generation and innovation are workshops, brainstorming, innovation jams, scenario analysis, internal networks, internal benchmarking, and intrapreneurship (Bessant & Tidd, 2007; Davenport, 2013; Dodgson et al., 2008; Tidd & Bessant, 2014).

2.3.1 WORKSHOPS

Workshops are a management tool often utilized to structure complex and fuzzy problems or tasks (Geschka, 1986). In an innovation workshop, a group of people collectively collaborates with the aim to solve one or several problems. Workshops aim to achieve a creative approach in order to unfold problems. When leading workshops it is important to elaborate and clearly formulate the problem (Geschka, 1986). Examples of these problems can emerge from accidents and unexpected events, which can open up for new angles and ideas. Moreover, regulations and future laws might also force firms to approach situations differently and find new solutions to either go round regulations or answer to them (Tidd & Bessant, 2014). Moreover, according to Geschka (1986), firms must carefully select the participants of the workshop. The intention is to assemble a group consisting of diverse people, contributing with unique and broad knowledge necessary to the problem or task. In addition, it is also important to include participants from different level and fields in order to achieve good conditions for the workshops (Geschka, 1986).

When the gathered group has its clearly defined problem, it is preferable to conduct idea generation activities such as brainstorming, brainwriting, or confrontations. Brainstorming is a beneficial and traditional tool for idea generation even outside of the workshop context (Bessant & Tidd, 2007). Hurt (1994) describes brainstorming to be an effective tool for idea generation. Further, a good brainstorming group should consist of five to twelve participants who hold diverse knowledge and experience. Some key points presented by Hurt (1994) are that the group should not involve too many 'specialists' as they tend to maintain the status quo. Instead, the workshop, or brainstorming session should preferably include participants who have previous experience in brainstorming activities, are effective in meetings, and are creative. Additionally, including bosses might prevent employees to express their true thoughts, as they might feel judged by their superiors (Hurt, 1994). Guidelines for the activity presented by Hurt (1994) involves allowing free thinking and expression for wild ideas, it should be forbidden to criticize, high quantity of ideas is preferable, and build on others' ideas.

In addition, there are more aspects to include. One is choosing a good location, which is neural and spacious. The facilitator is responsible for leading the activity, clarifying the topic and problem. It might good to consider holding a 10 min warm-up as an icebreaker for the group and to get them thinking in a creative manner (Hurt, 1994). An example of a warm-up question could be to ask them to come up with ideas within the topic that might get them fired, this will force them to come up with wild ideas and by adding humor, resulting in an open atmosphere (Hurt, 1994). Subsequently, when starting the actual workshop or brainstorming, the task or problem should be clearly stated and written down so that everyone can see it. The facilitator then starts to address the group or one of the participants to provide an alternative solution or idea, just to get it started. Additionally, it is important to keep the ideas coming and sustain a creative environment. These activities aim to abstract solutions to the problems by getting the participants to share their point of views (Hurt, 1994).

2.3.2 INNOVATION JAM

Another type of workshop is an innovation jam. During the last couple of years firms started to adopt innovation jams more extensively (Bjelland & Chapman-Wood, 2008; Tidd & Bessant, 2014). IBM developed the concept and the term Jam in 2001, and refer to it as a 'massively parallel online conference' (Bjelland & Chapman-Wood, 2008). IBM initiated the Jam to unite an otherwise scattered and globally dispersed organization. Moreover, firms utilize innovation jams to reach an extensive audience to subsequently obtain a broader scope of ideas compared to smaller workshop group (Bjelland & Chapman-Wood, 2008). Additionally, innovation jams could be internal, involve universities, business partners, customers, and suppliers (Bjelland & Chapman-Wood, 2008; Dodgson et al., 2008; Hordern, 2013). In the same manner as workshops and brainstorming in general, innovation Jams should uphold the perception that every idea counts, even though it might result in irrelevant and impractical to the firm's core business (Bjelland & Chapman-Wood, 2008).

IBM utilizes innovation jams for generating new ideas, discovering market opportunities, and unfolding new technologies (Dodgson et al., 2008). All IBM employees can participate in the innovation Jam, which kick-off from a thoroughly assessed goal, with a clearly formulated tasks or questions. Subsequently, the jams further enhanced the firm's values and helped generate valuable ideas to improve the operations (Bjelland & Chapman-Wood, 2008). Moreover, due to the large scope of involvement, participants do not need to interact. Hence, allowing everyone upload their ideas to a common platform. In turn, the platform allowed for interaction and successive building on each other's ideas in order to pursue and aid colleagues' ideas (Bjelland & Chapman-Wood, 2008). An issue emerging from activity however, is the dilemma of having participants building on each other's ideas or not. IBM experienced a high level of participation with a tremendous amount of valuable ideas, however only few revised and gave feedback, which resulted in similar and homogeneous ideas (Bjelland & Chapman-Wood, 2008).

When IBM opened up the innovation Jam in 2006, 150 000 people participated. Together they developed and generated 46 000 ideas within 72 hours. Thereafter, a committee later assessed and ranked the ideas, and decided on which to pursue (Bjelland & Chapman-Wood, 2008). Subsequently, the best ten ideas proceeded into prototypes. Even though IBM decided on pursuing only 10 of the ideas to prototypes, other ideas can be of strategic importance and result in follow-up projects as well. To finalize the annual innovation Jam, IBM publicly announces the 100 million dollar funding for the 10 projects (Bjelland & Chapman-Wood, 2008). IBM's Chairman and CEO, Sam Palmisano announces employees, clients and other members within the innovation network to accelerate the firm's ability within innovation (Dodgson et al., 2008).

2.3.3 SCENARIO ANALYSIS

Firms can reach additional sources of stimuli for innovation by envisioning and discovering future strands of reality (Tidd & Bessant, 2014). In order to unravel alternative trajectories, firms can explore and develop multiple futures and scenario analyses to grasp future scenarios (Bessant & Francis, 2005; Mercer, 1997; Tidd & Bessant, 2014). The groups participating in the scenario analyses are diverse, and should be similar to those for workshops. Moreover, to exploit the scenarios even further it is important to gain insight in operational constraints and realities and place less focus on operational details (Warren, 2012). Moreover, for a scenario analysis to be effective the organization must identify goals and constraints for strategic and operational purposes. Additionally, it is essential for firms to view the organization in a holistic manner and not function-by-function. The firm needs to consider the interdependencies and effects from different events and be as transparent as possible (Warren, 2012).

To conduct this type of analysis, firms set up a core purpose and focal area to research (Mercer, 1997). In addition, it is important to comprehend issues and opportunities the organization faces in order to ask the right questions, and collect relevant data for the scenarios (Warren, 2012). Additionally, Konno, Nonaka, and Ogilvy (2014) highlight the importance of background research on the topic to enable the formation of more informed scenarios. It is difficult to research the future however, it can still be of value to understand historical trend for future predictions. Subsequently, the scenario development process begins with a brainstorming session, allowing employees to highlight various scenario drivers. The selected drivers are factors affecting future industry environment (Mercer, 1997). Additionally, the group should discuss the environmental forces such as the introduction of new technology, currency fluctuations, or epidemic outbreaks that could have major impacts on the future.

The next step divides the drivers into groups or clusters to facilitate the construction of the scenario framework. When having identified two critical drivers, the most uncertain events with the highest potential impact, firms can define and develop different scenarios for the future (Mercer, 1997). To present the scenarios the group should construct a story about each

scenario. However, it is difficult for a larger group to construct a description all together. Therefore, it is common to use post-its where everyone posts his or her input to the scenario after a discussion. Thereafter, the input converts into a common story assembled by a smaller group (Konno, et al., 2014). To further elaborate on the analysis it is possible to utilize matrixes through the assessment of two critical drivers and subsequently identify scenarios between the axes. If executed correctly, firms will have several alternative scenarios, which will serve as a foundation for how to adapt to future contingencies. Hence, by utilizing scenario analysis firms can better comprehend uncertain future changes (Mercer, 1997). Interestingly, according to Tidd & Bessant (2014), firms have recently started to develop alternative scenarios jointly across firms and industries to extensively explore the future.

2.3.4 INTERNAL NETWORKS

An internal network is a *"complex, interconnected group or system, and networking involves using that arrangement to accomplish particular tasks"* (Tidd & Bessant, 2014, p. 302). Moreover, a particular task can be solving a problem or a challenge, for example through an event such as workshops. Tidd and Bessant (2014), portray the interactions within innovation in a model called the spaghetti model of innovation. The model visualizes how people talk and interact with each other in various ways. Subsequently, knowledge travels through a complex and interactive model, with the aim to discover useful innovations. The more connected the firm's individuals are within a network, the more knowledge and information are accessible to utilize for innovative purposes. To emphasize, the connections of a firm's employees have positive effects on the quality of the ideas generated for innovation (Björk & Magnusson, 2009).

As innovation becomes more complex it will need additional players participating in an extended network (Tidd & Bessant, 2009). In turn, Bessant and Francis (2005) explain it as high levels of actors involved in a network result in more potential for radical innovations. Networks emerging through informal interaction and environmental interdependence are emergent networks. On the contrary, networks specifically initiated for innovation are engineered networks. It requires triggering from within the organization, detached from interdependence or other common interests (Tidd & Bessant, 2014). Additional reasons for why internal networks can facilitate process innovation are that many challenges associated with process innovation emerge from the multifunctional nature of development and the lack of shared perspective on the goal. By collaborating across functions and communicating more, firms can solve essential problems utilizing each other's knowledge and capabilities (Davenport, 2013).

Handling innovations can become costly and inefficient if firms do not prioritize quality rather than quantity of the ideas (Björk & Magnusson, 2009). Hence, it is important to understand the basic knowledge about supporting and facilitating the internal idea generation process. One approach firms can undertake to enhance good quality ideas is to enable meeting points for exchange and communication about innovation. Björk and Magnusson (2009)

outline examples such as communities for creating and supporting idea generation, utilizing idea generation methods in projects and various groups, increasing formal cross-functional collaboration, and enhancing the flow of information and knowledge by e.g. knowledge management systems and idea databases.

Moreover, communication within the organization must be open and free in order for employees and business functions to share knowledge and competence and identify best practice (Davenport, 2013). As stated earlier, Björk et al. (2010) highlights the complexity of idea generation when involving large numbers of employees. A suggested solution is to manage idea generation with the use of new technologies and especially the Internet, which enables communication and collaboration across the world. Utilizing different web-based-technologies facilitates the communication within networks. The purpose of web-based-technologies is to function as a passive source of information platform, open to the organization (Tidd & Bessant, 2014). Moreover, Savoia and Copeland (2011) present a code sharing system at Google, which is a large web-based platform of shared information to enhance innovation and idea generation. This technology system enables the organization to access knowledge from different department set-ups to develop ideas for new operational methods (Savoia & Copeland, 2011). In turn, large networks increase diversity and knowledge sharing across functions, which could inspire to innovation.

2.3.5 INTERNAL BENCHMARKING

Southard and Parente (2007, p. 162) define internal benchmarking as *"the process of identifying, sharing, and using the knowledge and practices inside once own organization".* Internal benchmarking distinguishes from internal networks, as it is a process consisting of methods for how to take advantage of internal practices and processes. According to Ronco (2012), there is a variety in how different functions and departments structure and execute practices and processes. Therefore, by comparing and sharing processes and practices within the organization, opportunities for new ideas can emerge through knowledge and best practice already existing within the organization. Cross-functional collaboration and communication is beneficial for internal benchmarking as it improves performance and best practice within the organization (Ronco, 2012). Hence, organizations operating according to a silo-focused structure lack the ability to benefit from internal benchmarking. Ronco (2012) provides an example concerning the improvements and benefits Xerox obtained after comparing administrative processes with manufacturing processes. Even though the departments and their processes might have seemed different at first, there were still practices and processes they could benefit from sharing.

Opposite of internal benchmarking is external benchmarking, which might not be as effective. In other words, successful best practice in one organization might not be applicable for another (Ronco, 2012). Other benefits from internal benchmarking are the accessibility and availability of information, and the possibility to more easily transfer practices within the organization (Southard & Parente, 2007). However, there are disadvantages as well. The first

disadvantage is that by only focusing internally, firms can overlook the industries' best practice. The second disadvantage regards internal rivalry and competition between departments, however firms can mitigate those shortcomings by ensuring shared goals, and a holistic company view (Southard & Parente, 2007).

Before engaging in internal benchmarking, the firm should consider if they can duplicate the internal processes, if there are metrics available, if the processes are significantly superior, and whether the practices are transferrable or not (Southard & Parente, 2007). If the firm answers yes to all these questions, internal benchmarking is beneficial and preferred, however if not, external benchmarking is a great alternative. Further, an alternative method how to execute such internal benchmarking involves seven steps (Southard & Parente, 2007). Initially, the firm identifies the process chosen for review and constructs a team to perform the internal benchmarking. Subsequently, the firm should choose the most suitable tools for process analysis and recognize an additional internal process for assessment. After choosing two processes for comparison, the firm needs to clarify the differences between the processes to identify superior performance. Further, firms should estimate the transferability of activities and success factors, to finally implement and monitor the progress (Southard & Parente, 2007).

2.3.6 INTRAPRENEURSHIP

Antoncic and Hisrich (2003) define intrapreneurship as entrepreneurship activities within an existing organization. Intrapreneurship encourages activities operating within the organizational boundaries and aim to stretch current ways of doing business. They further refer to intrapreneurship as processes, which thrive within the firm (Antoncic & Hisrich, 2003). Even though the word itself might seem solely intertwined with corporate ventures and new business opportunities, intrapreneurship also involve innovative activities such as administrative techniques, pro-activeness and process innovation (Antoncic & Hisrich, 2003). Analyzing, nurturing and advancing e.g. innovations in production procedures and techniques, could eventually lead to significant improvements in firms' performances.

There are several ways to proactively search for new ideas. One common technique is sending out 'scouts' on a full or part-time basis to discover new areas and idea opportunities that trigger the innovation process (Tidd & Bessant, 2014). The scouts search for all types of opportunities such as technological, trends, behaviors, competitors, and emerging markets. Moreover, the scouts search after triggers and new ideas both internally and externally. The search areas are thereby not necessarily limited to within the organization or its industry, the search is more extensive reaching out to new and unknown markets and industries (Tidd & Bessant, 2014).

An additional approach is Corporate Venturing. In an innovation setting, the corporate venture is a team or unit that receives allocated resources to search for ideas both internally and externally (Tidd & Bessant, 2014). In turn, the aim for corporate venturing is to detect

and invest in new directions for the organization. An example of a corporate venture is Nokia Venturing Organization, which focuses on identifying and developing new businesses for growth opportunities (Tidd & Bessant, 2014). Google has a slightly different approach to resource allocation for innovation. They believe innovation comes from every employee and highlights that Google is an innovation business as all employees allocate 20 percent of the time for idea generation and innovation projects (Savoia and Copeland, 2011). In turn, instead of utilizing a unit on a full time basis to search for ideas the whole organization takes part in the idea generation and the innovation process (Savoia and Copeland, 2011).

2.4 PARADOXES TO IDEA GENERATION

The triggering phase could be rather unclear and difficult to structure (Brown & Duguid, 2000). Firms working with idea generations might face managerial difficulties, which could appear paradoxical. Björk et al. (2010), identify three additional challenges within incremental idea generation after having analyzed four large Swedish companies. However, the three companies in turn do not distinguish between incremental and radical innovation when providing data for the research, giving reason for the paradoxes to be applicable for radical innovation too (Björk et al., 2010). Further, Björk et al. (2010) do not explicitly differentiate between types of innovation, even though product innovation receives the majority of the attention from their case companies. The three paradoxes are *"the reliance on formal and informal structuring and process, direction of freedom in the searching for new ideas, and the level of involvement of all parts in the company or not"* (Björk et al., 2010, p.394).

Balancing formality and informality is vital as too much formality can hinder innovative ideas (Björk et al., 2010). Informal systems possess greater tendencies for enhancing radical innovations as formal systems might filter out and discard promising, radical ideas if they do not fit in the standardized process (Björk et al., 2010; Brown & Duguid, 2000). In contrast, too much informality can result in firms losing ideas and missing out on pursuing innovative opportunities (Björk et al., 2010). Informal processes suffer from lack of transparency, inefficiencies, and lack of control. Additionally, informal processes also rely on individuals' access to internal and external networks. Hence, individuals who have good ideas yet do not have the network or the competencies to pursue the ideas, is a consequence from having too informal ways of working. However, having too strong network ties can result in a decrease in radical innovation, as radical innovations often evolve from communication along loose ties (Björk et al., 2010).

The second paradox regards the level of scope, especially when balancing the search for new ideas (Björk et al., 2010). Some firms encourage all ideas and do not highlight any particular topic, whist other firms want ideas limited to a specific topic or challenge. Logically, little freedom, and subsequently a small scope or innovation area, narrows and limits the opportunities for ideas (Björk et al., 2010). Nevertheless, some firms successfully carry out campaigns to emphasize a specific area for innovation, and hence the firms will receive ideas

in line with what they desire. On the contrary, extensive freedom and a broad scope could result in an overwhelming amount of ideas. In turn, the firm could lose the core purpose of the idea generation session (Björk et al., 2010).

The last paradox articulates that firms must consider whether they should have high involvement of the workforce in innovation or not (Björk et al., 2010). One obvious positive consequence of involving many employees is the transformation of individual knowledge to organizational knowledge. Naturally, involving many employees in the idea generation process leads to more and diverse ideas, however it makes it harder to manage (Björk et al., 2010). High levels of inclusion automatically leads to more formal structures, which might result in drawbacks linked to formal and informal structured outlined in paradox 1. In addition, involving all these individuals could only be successful if there is sufficient time for them to participate. Hence, the employees would have to be able to spend time on innovation and balance the urgent, operational activities (Björk et al., 2010). The drawback of not being able to motivate time allocation for employees is that fewer participants logically contribute with fewer ideas. Nevertheless, the generated ideas are easier to capture and manage (Björk et al., 2010). On the other hand, if the firm limits the scope of attendants to a closely knit internal network there is a risk to not discover ideas and innovations as the network becomes too centralized.

Connected to the third paradox is the comprehension of the underlying work, and that current processes are of significant magnitude to process innovation. De Jong and de Bruijn (2013) argue that people actively trying to innovate often succeed in doing so; however, this does not mean that people are necessarily likely to adopt the innovations. People using a machine and working according to a process are more likely to innovate something, which carry a higher potential of acceptance from other users (de Jong & de Bruijn, 2013). To further emphasize, Tidd and Bessant (2014) argue for employee involvement in manufacturing process innovation, as presence in day-to-day operations enhances innovations.

2.5 HIGHLIGHTS

2.5.1 WHERE DO INNOVATIONS COME FROM?

Innovation is more than just a moment of ‘eureka’; firms can manage and systematically trigger innovation. By staying alert and being aware of the different sources of innovation firms can radically improve their innovation management. Examples of sources of innovations firms must scrutinize are shocks to the system, accidents, watching others, recombinant innovation, regulations, inspiration, knowledge-push, need-pull, and exploring alternative futures.

2.5.2 ACTIVITIES AND SUCCESS FACTORS

Table 1 displays activities utilized for triggering radical process innovation within manufacturing. Each activity couples with success factors to further emphasize their significance. The Highlights serve as a reference point to compare with the empirical findings in the succeeding chapters.

Activities	Success Factors
Workshops	Assemble diverse groups Clearly formulated task Open and non-judgmental environment
Innovation Jam	Thoroughly developed goal Reach a broader scope Platform allowing for interaction
Scenario Analysis	Highlight core purpose and field Focus on operations, not specific details Viewing the organization holistically
Internal Networking	Allow for emergent networks Compose engineered networks Cross-functional collaboration
Internal Benchmarking	Cross-functional structure Accessibility
Intrapreneurship	Prioritize time for idea generation Prioritize resources for idea generation

Table 1: Highlights, Activities and Success Factors

2.5.3 PARADOXES

Table 2 underscores the three paradoxes related to managerial issues.

Paradoxes
1. The reliance on formal and informal structuring and process
2. Direction of freedom in the searching for new ideas
3. The level of involvement of all parts in the company or not

Table 2: The Three Paradoxes (Björk et al,. 2010)

The recognized paradoxes are *"the reliance on formal and informal structuring and process, direction of freedom in the searching for new ideas, and the level of involvement of all parts*

in the company or not" (Björk et al., 2010, p.394). Firms utilizing idea generation activities should consider balancing the overall formality and informality of the practices. If the activities are formal in general, challenges are likely to appear, whereas if they are too informal, firms can lose effectiveness in process and control. Hence, by balancing the idea generation and formalize the informalities through adopted processes, systems and capabilities, firms can exploit their innovation practices in a better manner (Björk et al., 2010).

The second paradox concerns freedom or range of the implied innovation focus (Björk et al., 2010). A narrow focus area for innovation results in a limitation of ideas, and in turn makes it easier to capture and assess ideas. However, the firm might lose the core purpose of the idea generation if the scope is too broad and shallow (Björk et al., 2010). The last and final paradox is whether to involve all parts of the company or not. Many participants logically result in more ideas, especially with the decreasing cost of managing it through new technologies. However, time needs to be set aside for innovation, which might be hard to motivate. If the firm achieves internal networks there is a risk for it to become too centralized and closely plaited. Consequently, these kinds of networks can result in overlooking and losing radical ideas (Björk et al., 2010). Tied to Björk's et al (2010) third paradox, de Jong and de Bruijn (2013) and Tidd & Bessant (2014) highlight the importance of also including manufacturing workers in process innovation. Even though they might have little time for innovation, they possess valuable knowledge for process innovation, as it is present in their day-to-day work.

3 METHODOLOGY AND METHOD

The methodology and research method chapter provides the basis for the research in this thesis. The chapter explains the research approach, research design, research method, project sponsor selection, data collection, data analysis, and research quality utilized to obtain the results in the most appropriate manner.

3.1 METHODOLOGY

3.1.1 RESEARCH APPROACH

There are two approaches on how to gather data, namely inductive and deductive. This research mainly follows an abductive approach, iterating between theory and empirical data (Bryman & Bell, 2007). The starting point of an abductive approach is observations and findings, aiming to build theories as simultaneously researching theory. It is inductive because observations and empirical findings will serve as the base when identifying the triggering of the innovation process. However, it also entails elements of deduction as theory shapes and structures the empirical findings (Bryman & Bell, 2007). In addition, there are limitations within process innovation theory, further enhancing the reasoning in favor of including an inductive approach (Davenport, 2013). Nevertheless, it is difficult to pursue a topic completely neglecting previous knowledge. Thus, theory obtained influences the line of reasoning, providing the research with flexibility. Whether a research holds an inductive or a deductive approach are tendencies rather than rigid rules (Bryman & Bell, 2007). To emphasize, the thesis takes on an abductive approach.

3.2 METHOD

3.2.1 RESEARCH DESIGN

The research design for this thesis is a Case Study, focusing on a specific organization. Yin (2009, p.18) states, *"a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real life context"*. Thereby, the strategy was to extract vital information from the empirical findings to identify the innovation process for manufacturing processes. As there are limitations in literature for process innovation, a case study allowing access to empirical findings was vital. Moreover, a case study is applicable for questions starting with when, how, and why, which further supported the decision for conducting a case study (Yin, 2009).

Focusing on a single organization allows for in-depth description of the social context of a business entity (Yin, 2009). Again, as literature within process innovation is limited, the research is dependent on empirical findings evolved from a social context. Getting access to an entire organization enabled thorough in-depth research to understand the topic not yet

described by literature. The chosen multinational organization, facilitating the in-depth understanding of process innovation is OMD. The research was ongoing for approximately five months, to get sufficient data to map out the current state of the business. In addition, the study is a representative or a typical case, explained as exploring a case similar or representative to other organizations (Bryman & Bell, 2007). Consequently, the findings within the researched business unit, aim to be applicable for other similar operations within OMD. It could be possible to apply a multiple-case study, benchmarking OMD's innovation process and comparing their process with other companies. Nevertheless, as literature is limited and there is little evidence of best practice, focusing on one single case is appropriate for answering the research question.

3.2.2 RESEARCH METHOD

The qualitative method is best suited for inductive research projects, which hold an interpretivistic philosophy, as well as a constructionist view (Bryman & Bell, 2007). Subsequently, this thesis builds on qualitative research methods. Numbers and statistics cannot answer the research question. Instead, interviews and observations facilitated the progress of unfolding the research question; this gives reason for applying a qualitative research method and not a quantitative. The qualitative research method will enable in-depth understanding of the process innovation by including different interpretations and views of the social phenomenon (Bryman & Bell, 2007). In addition, the research is exploratory in nature. Therefore, it could benefit from allowing more flexibility and adjustments throughout the research process. As already stated, limitations in literature for process innovation placed pressure on the empirical findings to be of quality and contain sufficient information to identify the current process. Thus, in-depth interpretations of OMD's current state facilitated the description of the innovation process. The qualitative method can provide researches with rich data, supporting a broad and holistic view (Bryman & Bell, 2007).

The qualitative research follows a six-step-model as shown in figure 7 (Bryman & Bell, 2007). If the data turns out to be insufficient, or if the research question requires a change, additional data might have to be collected. Moreover, *"overlapping data analysis with data collection not only gives the researcher a head start in analysis but, more importantly, allows researchers to take advantage of flexible data collection"* (Eisenhardt, 1989, p. 539). Thus, the flexibility in a qualitative, case study enhances the opportunity for a successful outcome.

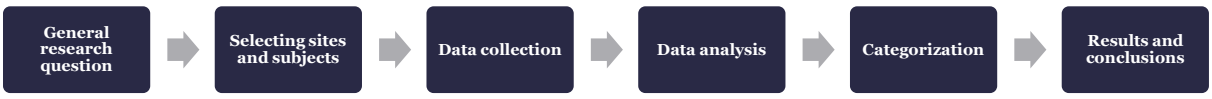

Figure 7: Six-Step-Model for Qualitative Research (Bryman & Bell, 2007)

3.2.3 PROJECT SPONSOR SELECTION

According to Utterback and Abernathy (1975), the product life cycle (PLC) indicate the stages in which a firm operates within an industry, and whether the firm should place focus on product or process innovation (see figure 5). The first stage indicates a novel industry where much focus is on product innovation, whereas the firms in the subsequent stage focus on expanding business and starting to evaluate manufacturing processes. The last stage contains mature firms in relatively stable environments with process innovation in operations and production as the core focus (Dodgson et al., 2008). Hence, as this thesis focuses on process innovation, the project sponsor would preferably be an incumbent firm operating in a mature market with incentives to focus on process innovation rather than product innovation.

The selected project sponsor is a large manufacturing company[2] operating in multiple countries worldwide. The focal company for the research consists of three divisions, where one of the divisions initialized the project (figure 8). The project sponsor division makes out 60 percent of the company's total sales, and is the manufacturing division. Within the selected division, the thesis focuses on those departments that closely relates to manufacturing process innovation. The thesis project originates from the global Process Development department. This department serves as a link between the global R&D department and the process developers for the factories. The larger global factories hold a department for local process development. Those teams collaborate with the process development department. Due to time and resource constraints, the thesis only focuses on the local Process Development. Additionally, product development respondents provided noteworthy input. By interviewing other departments, an internal benchmark activity can exploit already developed activities and success factors within innovation (Ronco, 2012).

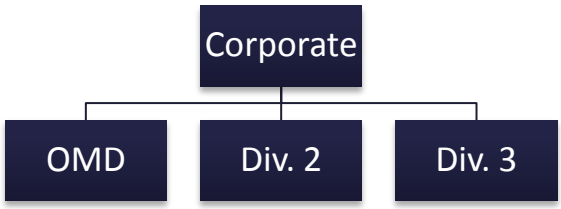

Figure 8: Organizational Chart

To enrich the research and obtain relevant data the mentioned departments provide respondents. Therefore, due to the inclusion of both R&D, global process development, local process development, and product development the thesis obtain sufficient width and depth in empirical data for process innovation to answer the research question. In addition, to answer the research question the thesis traces back innovation projects to identify the triggering of the

[2] A large manufacturing company is an organization containing average number of 50 employees, a balance sheet total of more than SEK 40 million, and an annual turnover of more than SEK 80 million (Bolagsverket, 2012)

innovation process. All projects involve employees selected as respondents for the research. Further, by including these respondents, the thesis gain concrete evidence of radical process innovation.

3.2.4 DATA COLLECTION

According to Saunders et al. (2009), the research question defines the method for collecting data. This thesis has an explorative nature and the data collection must support an in-depth understanding of the organizational context. Both primary and secondary data are vital to grasp the topic. As discussed earlier, limitation within research for process innovation made it impossible to solely rely on secondary data (Davenport, 2013; Reichstein & Salter, 2006). Consequently, primary data was the main type of data collected to compensate for the insufficient secondary data. However, secondary data within closely associated research areas showed to be of significance. To clarify, the secondary data is to some extent intended for product innovation practices rather than process innovation. Nevertheless, the assumption is that most theories for product innovation could be applicable for process innovation as well.

3.2.4.1 INTERVIEWS

Further, as this research aims to discover individuals' thoughts and interpretation open interviews are beneficial (Jacobsen, 2009). Therefore, the primary source of data collection was semi-structured interviews, which is an alternative structure in-between the two extremes namely, open interview and structured interview. The semi-structured interviews allows openness and rich, detailed answers from the interviewees as there is often not a pre-set order for the questions, which can vary depending on the course of the conversation (Jacobsen, 2009). However, the interview guide contained a fixed set of questions and topics to cover (see Appendix A). Besides the general questions about triggering radical process innovation, the thesis traces back innovation projects. Therefore, the interview guide contains questions specific for those projects. Moreover, the conducted interviews were face-to-face (F2F) in order to avoid misinterpretations. Additionally, the chosen language for the interview was Swedish to secure trust, and prevent or limit language barriers (Jacobsen, 2009). However, due to travel limitations one interview was via phone and in English.

In addition to semi-structured interviews, unstructured interviews and other necessary information such as, emails, company reports, presentations, observations, and information from OMD's intranet gave further insight. The unstructured interviews involved conversations in the coffee room and potential spontaneous questions arising along the way. These observations and additional documents enriched the research and provided vital information to identify the innovation process. In contrast, books, academic journals, and Internet browsing served as the fundamental base for assembling secondary data. The secondary data created a good foundation for the research and provided further understanding and structure to the interview guides and analysis. Table 3 displays information about all interviews to show transparency and an overview of the respondents.

Department	Respondent	Date	Duration	Type	Language
Process Development	Respondent A	2015-03-30	60 min	F2F	Swedish
Process Development	Respondent B	2015-03-24	60 min	F2F	Swedish
Process Development	Respondent C	2015-03-17	60 min	F2F	Swedish
Process Development	Respondent D	2015-03-27	90 min	F2F	Swedish
Process Development	Respondent E	2015-03-23	60 min	F2F	Swedish
Process Development	Respondent F	2015-04-07	60 min	F2F	Swedish
Process Development	Respondent G	2015-03-27	60 min	F2F	Swedish
Process Development	Respondent H	2015-03-26	60 min	F2F	Swedish
Product Development	Respondent I	2015-03-16	60 min	F2F	Swedish
Product Development	Respondent J	2015-03-04	60 min	F2F	Swedish
Product Development	Respondent K	2015-03-04	30 min	F2F	Swedish
Operator	Respondent L	2015-03-26	60 min	F2F	Swedish
Operator	Respondent M	2015-03-26	60 min	F2F	Swedish
Corporate Innovation	Respondent N	2015-03-30	60 min	Phone	English

Table 3: Interviewee List

Table 4 provides an overview of the selected innovation projects and the individuals involved.

Innovation Project	Project Leader	Receivers	Stakeholders
Project 1	R&D	Respondent H	Respondent A & G, R&D
Project 2	Respondent G, R&D	Respondent H & G	
Project 3	Respondent E	Respondent D	Respondent F
Project 4	Respondent C		Respondent A & B

Table 4: Innovation Project Specification

3.2.5 DATA ANALYSIS

Different analysis methods facilitated the analysis of the complex situation of OMD. The analysis in the thesis builds on coupling between secondary and primary data to reveal interesting, relevant information. First, sifting through the secondary data, and more specifically the scientific articles, resulted in a Systematic Literature Review (SLR). Additionally, the analysis of the primary data, more specifically the interviews follow a fixed process portrayed by Saunders et al. (2009). The process includes unitizing data, categorizing, recognizing relationships and developing categories, and developing and testing theories to

reach conclusion. Therefore, recorded and transcribed data provided a good overview for the semi-structured interviews. The unitizing data from the semi-structured interviews highlight key information in the search for patterns, quotes and understandings of the innovation process. Secondly, categorizing the information facilitated the search for relevant information. Third, structured and organized information evolved from the recognition of relationships and development of categories. The last step, developing and testing theories to reach conclusion smoothened the analysis process (Saunders et al., 2009).

As the thesis does not generalize, OMD refers to the respondents and not the company nor the division. Rather, it is the opinion of the respondents the thesis highlights. Moreover, when referring to all of the respondents within the same department, the thesis display the department names only, not the respondent specific number.

3.2.6 RESEARCH QUALITY

This thesis aimed to uncover and portray the triggering of the innovation process at a specific division within a large, manufacturing company. There are no utilized and globally implemented ways or activities for the triggering phase other than underlying, implicit ones (Herstatt & Verworn, 2001). Thus, the situation is complex, there are many factors to consider, and one immediate challenge for the thesis was to achieve good quality through high trustworthiness. When discussing research quality, validity and reliability are the main factors to consider. However, Bryman and Bell (2007) suggest other criteria for assessing a qualitative study namely, trustworthiness and authenticity are more appropriate. Triangulation is important to secure trustworthiness. The research included multiple methods or data sources to emphasize triangulation. Involving several cross-functional respondents at OMD, as well as combining the empirical findings with the theoretical framework, secured consistency in the presented data, and triangulated this research.

To increase trustworthiness the thesis provides a transparent and clear description of the research structure and progress. A qualitative research is difficult or even impossible to replicate however, with transparency and clearness the possibility to replicate increases (Bryman & Bell, 2007). Further, stated in delimitations the case study does not aim to generalize to a broader context across industries. Nevertheless, the thesis result could be applicable for similar contexts e.g. other manufacturing sites within OMD. To finalize and decrease bias, an active approach towards diminishing false interpretations was vital. Hence, the researchers piloted the interview guides in beforehand, to prove its relevance for gathering the correct information. To avoid researchers and context bias the same researchers conducted all interviews in similar settings (Jacobsen, 2009). Additionally, by tracing the four innovation projects the interviews provided concrete examples of radical process innovation to the respondents. Hence, by investigating the projects further the respondents could identify performed activities and not only random methods. An additional approach to avoid false interpretations was to triangulate the transcribed and recorded interview material with knowledgeable individuals familiar with the specific study (Bryman & Bell, 2007).

4 EMPIRICAL FINDINGS

Chapter 4, empirical findings, portrays the primary data collected through interviews and observations. The structure follows the logic of the theoretical framework presented in chapter 2, to clearly and transparently display the data in a structured manner. In turn, the structure supports the connection to the research question, later supporting the analysis.

4.1 SETTING THE SCENE

4.1.1 PROCESS INNOVATION

The first topic is the definition of process innovation, and the important factors of it. Respondent J (2015) describes, *"Innovation as a whole is more fundamental and extensive than improvement; it has more loose ends to it".* Respondent H (2015) emphasizes the intense research and radical approach towards innovation in comparison to improvements. Further, Respondent E (2015) continues by stating that innovation is essentially about idea generation; the team or the managers should not reject ideas solely because they appear to be too crazy. Respondent D (2015) believes innovation is bringing two or more very different things together, and introducing something new in a different environment and setting. Innovation could also be a new solution to an old problem (Respondent A, 2015). Similarly, process innovation regards thinking outside-the-box (Respondents F & H, 2015).

Respondent B (2015) argues for innovation to be a structural way of working; not a 'happening'. Ideas can *"emerge by chance, yet without the structure they fall between the cracks"* (Respondent B, 2015). Hence, the company must trigger innovation and provide it with a structure (Respondent B, 2015). Similarly, Respondent D (2015) states there are no exclusively creative jobs, as all jobs needs creativity. OMD encourages initiative to innovation at some parts of the organization however, there are many different aspects to innovation, and sometimes encouragement is not enough (Respondent D, 2015). Respondent B, J, and K (2015) express encouragement for innovation to be low in the product department and for factory operators. Nevertheless, encouraging innovation should be a fundamental pillar in the company culture (Respondent D, 2015).

Respondent E and G (2015) believe product and process innovation to involve the same approach and ways of working. Process innovation within manufacturing is similar to product innovation as it often comes down to a machine, improving the process (Respondents B & E, 2015). More specifically, Respondent A (2015) explains that innovating one section of the chain is also process innovation. In addition, Respondent L (2015) explains that OMD products have a very long product life cycle, which places more attention on process innovation in comparison to product innovation. However, Respondent D (2015) believes that process innovation is mostly incremental and it is difficult to radically innovate on lower levels, without support from superior management. To exemplify, a major obstacle in the early phases of Project 1, Respondent F (2015) states the top management team did not

request the project specifically. The lack of top management's buy-in subsequently caused problems for the evolvement of Project 1 (Respondent F, 2015).

Today, the process innovation structure is inadequate (Respondents A, B & D, 2015). Respondent A (2015) argues they have processes to capture and solve problems however there are no implemented processes focusing on capturing process innovation. Respondent A (2015) questions*, "If process innovation is important for our survival, why do we not have a process for it".* Moreover, process innovation at OMD is about major, radical changes within the manufacturing process (Respondents A, B, D, & H, 2015).

Respondent N (2015) is responsible for innovation management at the company OMD belongs to. Corporate innovation regards the whole innovation process, both products and processes. Respondent N's (2015) role includes reassuring the highest quality of all innovation processes within the company. All major innovation board projects concerning radical innovation evolve at group level rather than within the business areas (Respondent N, 2015). Respondent N (2015) further explains there are no specific differences between product and process innovation in regards to approach, as the difference mainly concerns the final customer. Innovation management within the company focuses more on product innovation than process innovation, as they *"sell products to customers, not processes; we only sell processes to our own factories"* (Respondent N, 2015). Today, no specific person, team, or department possesses any direct responsibility for process innovation on a company level. The formalization of the process to innovate manufacturing processes is weaker than for products. For local innovation, everyone can apply ideas, the factories work with continuous improvement activities, which can differ amongst the countries (Respondent N, 2015).

4.2 TRIGGERING RADICAL PROCESS INNOVATION

4.2.1 WHERE DO INNOVATIONS COME FROM?

The next section regards idea generation. Respondent B (0215) argues for the significance of triggering and luring ideas, *"most people have ideas; however we have to lure them out".* Respondent K (2015) expresses, OMD is bad at triggering and generating ideas, the innovation climate is central, and the organizational structure must support it. However, some individuals and teams succeeded to develop a good climate for innovation (Respondents D & E, 2015). One important factor is collaboration; Respondent D (2015) requires collaboration amongst the team and sees success in doing so.

Respondent A (2015) believes ideas exist however they must find a way to capture them. They do not have a process for idea generation (Respondent A, 2015). Respondent A (2015) believes OMD should structure idea generation, as *"some traits separating the human being from other species are adaptability, creativity, and possibility to invent"*. Therefore, Respondent A (2015) challenges the idea of the organization to take advantage of these traits, and subsequently become superior in triggering innovation and increase process innovation.

Respondent C (2015) portrays idea generation as evolving by chance *"for me, innovation often emerges from unexpected exposure, as a coincident"*. Further, innovation often surfaces from problems or a mistake. Respondent A (2015) is of the opinion that by working with problems and solving them, innovation evolves. An example is Project 3, which initially derived from a factory need; the new machine should be safer and mitigate accidents. Moreover, Respondent C (2015) does not believe it is simple to force someone to generate ideas, and developing new ideas systematically as "*steering is not always successful as it reduces motivation*". Innovation rather initiates through exposure; ideas have a tendency to emerge at an operator, when thinking about new solutions and what could be better (Respondents B & C, 2015). To emphasize, Project 3 emerged from a Dutch electrical razor company who possessed and held a leading position within the manufacturing technique. Nevertheless, the product as a whole is not an OMD invention; OMD rather developed the operational aspects of it (Respondent A, 2015)

Further, Respondent C (2015) does not believe in traditional activities, forcing employees to sit down by the desk and produce ideas. Rather, ideas emerge from external exposure and sidetracks from the current business (Respondents B & C, 2015). To exemplify, the first initiative can emerge from fairs and conferences, however mostly it might be from mistakes and issues from before, which in turn result in innovation (Respondent C, 2015). Moreover, Respondent B (2015) highlights the importance of the reality to focus and comprehend the real, operative business. To further emphasize innovation's uncertainty and contingency, *"the innovation path is not linear, it varies and iterates. All cases are unique; we trigger ideas at factories, airports, at home, or over a beer"* (Respondent C, 2015).

Respondent L (2015) adds that specific information and knowledge about the manufacturing process exists within employees working with the process on an everyday basis. This is where many ideas emerge, and operators are often very driven and eager to execute their own ideas (Respondent A, 2015). Respondents L and M (2015) both believe the factories do have ideas and it is not about the individuals' mindset and creativity, rather they do not pay attention to the ideas, as they do not know how to proceed. Respondent L (2015) states, *"in the best of worlds, we would know exactly how to document and pursue with the ideas, and then when there is time and no acute problems, we can dig into the database and develop those ideas into innovations".* Today, OMD lacks the structure of spreading and sharing that knowledge (Respondents L & M, 2015). Similarly, Respondent A (2015) expresses their strength lies within execution and has concerns for proper documentation, as this is insufficient today.

When further developing the embryo of the idea, the interface is important (Respondent C, 2015). An individual can come up with the initial thought, however might need additional input for it to become an idea, hence contacts and collaboration with people with other backgrounds and experience could help take the ideas further (Respondent C, 2015). Similarly, Respondents B and D (2015) believe it would improve process innovation if the different interfaces within the process loop information, and continuously communicated feedback back and forth. As an example, if an embryo of an idea proceeds to another department, which kills the project, the initial idea generator should be able to approach with new arguments through continuous communication (Respondent B, 2015).

Utilizing human resources to the fullest and triggering innovation, Respondent B, C, and I (2015) state that resources and time allocation is central. Without freedom, vital parts of idea generation disappears *"once you have an idea, or an embryo of an idea, you want to be able to work with it right there and then, not next week or in a year. Limiting the possibilities to work with ideas might result in them getting fuzzy and subsequently they will disappear"(*Respondent C, 2015). Respondent I (2015) further argues that to acquire and obtain the resources needed, the support must come from higher levels. Hence, the ideas must be in line with core business and corporate strategy if the top management team does not see the benefits from the ideas they will not support the project. Hence, the decision must evolve from the top, *"local projects might get a break through, however if the top does not accept it, it will never proceed"* (Respondent F, 2015). A goal could be to *"become the best in the world, then the focus will be clear, and the organization will work towards becoming the best"* (Respondent I, 2015). Respondent I (2015) continues by stating top management is often supportive to innovations. The issue relates to reluctant middle managers, afraid of new ideas and outside-the-box-thinking. In addition, Respondent I (2015) believe it is vital to engage the right people in innovation and encourage innovation through incentives.

Respondent D (2015) is in contact with R&D through global process development, although sometimes they have technical representatives in R&D projects (Respondents D & F, 2015). However, R&D does not encourage or even appreciate the technicians to attend their processes and meetings (Respondents D, G, & H, 2015). Respondent D (2015) believes R&D has a philosophy about *"what is invented here stays here".* To elaborate, it might evolve from higher steering of R&D, although R&D might change if someone forces them (Respondent D, 2015). One major obstacle expressed by Respondent H and G (2015), is the feeling that R&D does not take interest in ideas emerging from the factory level; most perused ideas seems to come from higher levels. In general, all departments working with process development seems to be silo-focused (Respondents G & H, 2015). Respondent D, H, and G (2015) do not have access to the project portfolio, and are unable to follow the progress of the process innovation, which subsequently hamper and infect the urge to innovate and generate new ideas. Frustration of slow processes within R&D and lack of feedback hampers ideas (Respondents D, G, & H, 2015). Concerns surfacing around this issue are *"is it too secret for OMD? We work for the same company"* (Respondent G, 2015).

4.2.1.1 INCENTIVE FOR IDEA GENERATION

Incentives are central when enabling for emerging ideas (Respondents H, I, & J, 2015). Respondent E (2015) believes that the incentive comes from trying to find easier ways. People always appreciate monetary incentives; however, intangible acknowledgements are just as important (Respondents I & J, 2015). Respondent H (2015) believes that motivation and incentives concerns leadership. Respondent D (2015) describes that a clear goal and a challenge inspires innovation and solutions to problems. Moreover, Respondent B (2015) emphasizes that people are different; receiving a diploma or acknowledgement might honor some, and others might only appreciate monetary rewards. For example, *"being part of the development, to feel proud of your accomplishments, and knowing how the idea progresses,*

provides incentive" (Respondent I, 2015). Respondent H (2015) adds, *"It is fun to work with something that adds value".* Moreover, Respondent A (2015) believes that everything people do is for their own gain. People are in general extra proud over things they developed and implemented and this is a major incentive for innovating (Respondent A, 2105). In turn, it is also important that the company knows who developed the idea, and subsequently gives credit to the right person (Respondents A & I, 2015). An additional issue concerns filing patents (Respondents G & I, 2015). Many emerging ideas might be good, and proceed into patent filing, however the development of the idea stagnates as it does not proceed into development. After filing the patent, the idea ends up in a box with other unused patents (Respondents G & I, 2015). To emphasize, Respondent I (2015) apprehends that the managers strive for quantity in number of patents, and not the quality of implemented innovations. Moreover, an additional concern is that when filing patents the idea becomes public and exposed to competitors. In turn, they can leverage on a patent that OMD placed in a box (Respondent B, 2015).

Respondent N (2015) believes the incentive for innovation is different depending on the individuals. However, the greatest motivation is recognition of their work by people they believe to be competent authorities, and to actually see their ideas implemented. *"Having good ideas without having any of them implemented creates frustration"* (Respondent N, 2015). To enumerate additional motivational factors, Respondent N (2015) states, empowerment, and the possibility to proceed with own work and exploration is important. Moreover, today individuals receive economic benefits for patents, which can result in filing patents with questionable value. Related to rewards based on patents Respondent N (2015) adds, *"you measure the wrong things"*.

4.3 ACTIVITIES AND SUCCESS FACTORS FOR IDEA GENERATION

Respondents J, H, and E (2015) highlight the significance of having a clearly formulated problem statement for all idea generation activities. When the problem statement is clear, the next step will be easier when pursuing innovations through activities by assembling, combining, and trying to innovate for different purposes (Respondent J, 2015). On a corporate level, the manager initiates idea generations after identifying the area or challenge. Thereafter, they collect the ideas and subsequently perform an evaluation (Respondent N, 2015). Respondent N (2015) describes the initial stage of the funnel to be central; here the company has higher chances to influence. Hence, Respondent N (2015) states that the company emphasizes the importance of setting the field for innovation. The company often utilizes challenges as a starting point for triggering innovation. Clear and bold challenges trigger radical innovation more than having generic, open field discussions, instead challenges trigger radical innovation (Respondent N, 2015). For example, the first initiative for Project 1 derived from a challenge from top management, saying the factory should decrease its costs by ten percent (Respondents D & F, 2015). In turn, the team discovered the efficiency to be static for 30 years, hence identified innovation potential (Respondent E, 2015). Additionally, *"as the*

challenge is the starting point for innovation you have to be smart about it, and be very specific about what you want to achieve" (Respondent N, 2015).

Respondent E (2015) believes most ideas origin from when people sit down and talk. Respondent B (2015) emphasizes the fact that their team always has morning meetings where they frequently share opinions and ideas. Likewise, in Respondent E's (2015) team, they talk frequently. To trigger the flow of the communication they bring in external influences as news and research to fire off ideas, and trigger innovation. Respondent B (2015) believes in open and spontaneous environment when triggering innovation. However, without structure, companies and departments might lose ideas and in turn valuable innovations (Respondent B, 2015). Hence, Respondent B (2015) wants to structure idea generation. Respondent B (2015) expresses a concern in balancing openness and structure; *"without structure you lose ideas, whereas too much structure is boring and annoying"*. Throughout the process, feedback is of high importance; employees should know why their ideas proceeded and why the management rejected those ideas (Respondent N, 2015).

4.3.1 WORKSHOPS

Most respondents confirm the exploitation of workshops within OMD (Respondents B, C, D, E, F, G, I, & J, 2015). However, despite the occasional brainstorming and discussion, they do not proceed with workshops systematically (Respondents B, C, G, & H, 2015). Workshops can be good, however it is time consuming, and often it does not result in the wanted outcomes (Respondent C, 2015). For cost reasons, it is often half a day at a conference center (Respondent C, 2015). In turn, Respondent C (2015) does not believe in measuring and forcing innovation. In contrast, Respondent B (2015) suggests measuring innovation and generating ideas per department could be valuable in order for the employees to share their ideas. However, it should serve as a motivation rather than an obligation (Respondent B, 2015). The rewards should not be monetary, nor affect the department negatively if not reached. Moreover, the department receives the reward, in terms of a dinner, social event, or similar (Respondent B, 2015). Moreover, there are not a lot of workshop initiatives from within the company or from management (Respondent J, 2015). Respondent E (2015) states the initiative on activities often emerges from the project leader.

4.3.1.1 ATTENDANTS

The first step in the workshop process often starts with the middle manager stating a problem (Respondent I, 2015). Thereafter, the project managers are the ones initiating the workshop and brainstorming sessions. The assembled group of participants is usually 2-30 people (Respondent I, 2015). However, Respondent J (2015) states that they are usually 7-8 people attending the workshops (Respondent J, 2015). Further, Respondent E (2015) states there are often at least five participants in the groups. The project leader might already have an assigned project group, however to enable additional aspects and a broad spectrum, they normally try to involve other organizations, such as the supply chain department, and

manufacturing (Respondent E, 2015). Sometimes, the workshop groups are smaller if discussing a secretive and sensitive subject. To exemplify, one of the process development departments try to exclude operations from very early stages in the ideation, if the project is sensitive and might result in major changes (Respondent E, 2015).

Respondent I (2015) expresses that the workshop groups often are homogeneous, consisting of men who are responsible for the factories. Due to the lack of diversity Respondent I (2015) believe they *"limit the line of ideas"*. Further, the invites to workshops have a tendency to appoint employees known for their innovativeness, which in turn leads to similar group formations for a majority of the workshops (Respondent I, 2015). Respondents J and G (2015) state, the aim of the group selection is to achieve cross-functionality and a well functioning group. According to Respondents J and E (2015), OMD is good at assembling cross-functional groups. To exemplify, if a team should develop a new product or method, the group should consist of people from manufacturing, engineers, specialists with deep knowledge, and a developer. Hence, the aim is to cover all areas (Respondent J, 2015). Additionally, Respondents D and E (2015) also believe it is important to include different type of people. The project manager should include *"the person who aims for the sun, because we have already been to the moon and someone with a more 'sober' approach to innovation, to balance the team"* (Respondent E, 2015).

In addition, it is important to include different personalities and competencies (Respondents D, F, I, & K, 2015). Respondent N (2015) considers idea generation challenges should include individuals who are smart and courageous enough to discover and explore new ideas. Respondent D (2015) believes in removing prestige and having respect for others' competencies, *"today, some people do too much by themselves instead of delegating to someone with better front-edge competence"*. Moreover, *"as a leader, one should admit others' competencies and be responsible for assembling correct and proficient groups with the right knowledge, competencies, and personality. Leaders should also be responsible to steer the group to obtain innovation"* (Respondent D, 2015). Further, Respondent F (2015) explains that they are often 3-4 process developers who work tightly together and each person possesses different competences and experiences to form a good group. However, Respondent E (2015) believes OMD should assemble even more diverse groups, and include a large scope.

An issue is that some people always bring up the same ideas, and in turn brainstorming does not provide with much new things (Respondents C & J, 2015). Therefore, the ideas do not become radical, as it only is a reuse of old ideas. To emphasize, *"if you ask the same question 1000 times you will get the same answer"* (Respondent J, 2015). Therefore, Respondent J, G, and E (2015) stress the importance of a good facilitator, to obtain the right innovative mindset in the group and help everyone speak their mind. The facilitator's role is important to avoid having some people taking over the discussion and to prevent digression. Respondent E (2015) further elaborates, *"a facilitator should almost be an actor, forcing people to step out of their comfort zone and aim high"*. As the facilitator and project management role is important, OMD previously hired project manager specialists to run the project and workshops (Respondent J, 2015). However, a negative aspect with hiring project manager

specialists is the lack of necessary technological knowledge. Today, despite the project manager specialists' excellent skills in project management, OMD assigned one of the regular team members to manage the projects in their day-to-day position (Respondent J, 2015). As a result, the employees currently leading the projects are engineers or technicians; hence, the project might be more loosely lead. In turn, the workshop leaders possess proficient technological skills, however lack some management capabilities, and project experience (Respondent J, 2015).

A suggestion is to bring in external expertise to manage and facilitate workshops (Respondent J, 2015). In the past, an IT consultancy firm held a workshop internally within the firm and brought the finished results to OMD. However, they had little knowledge about realization, which made the majority of the ideas impossible to carry out (Respondent J, 2015). OMD is aware of limitations, what is feasible and not, which could be beneficial. Nevertheless, expertise within the subject can also hamper the idea generation as employees see limitations rather than possibilities (Respondent J, 2015). One solution is to bring the two together and include external and internal participants in the workshop, and use tools for encouraging people to think in new ways. This in turn could enhance radical process innovation (Respondent J, 2015).

4.3.1.2 BRAINSTORMING TOOLS

All respondents emphasize the significance of having a clearly formulated task before the workshop starts. Additionally, it is important to embrace an open and non-judgmental environment where everyone can share and no one may criticize (Respondents B, D, I, & J, 2015). Moreover, a workshop is not only an open discussion; additional tools can improve the activity. For example, after having gathered people in a room, each participant writes down their ideas on post-its (Respondents B, I, & J, 2015). Subsequently, the attendants group the ideas, put them on a wall, to further build and develop each other's ideas (Respondent J, 2015). Hence, post-its are beneficial for categorizing ideas on a board, allowing for visualization and extensive participation. Nowadays, to further enhance visualization, facilitators utilize digital boards for workshops (Respondent I, 2015).

Moreover, Respondent D (2015) also states the team utilizes different creativity tools within these workshops, for example bonus thinking hats to enhance creativity and approaching problems in new angles. Ideas also emerge by utilizing alternative tools for workshops, for example SCAMPER and Use-IT (Respondent J, 2015). SCAMPER is a tool, which the product development department can utilize for idea generating activities (Respondent J, 2015). It facilitates the mapping of possible innovations by, finding a substitute, combining existing components, adapting it to a new setting, modifying, put to other use, eliminate, reverse, or remove (Respondent J, 2015). An additional tool mostly applied to product innovation is DFSS (Respondent F, 2015). This tool facilitated the workshop of 'pre-study' phase where ideas about how to solve problems emerge, (Respondent D, E & F, 2015). In turn, this is what Respondent F (2015) considers as a huge strength when working with idea generation, as well as careful calculations and no restrictions in what is possible. Moreover, tools utilized within the workshops for product innovation on a corporate level are complex

and simple brainstorming, Theory of Inventive Problem Solving (TIPS), building and reassemble other's ideas in order make superior hybrid ideas (Respondent N, 2015). Moreover, a good facilitator is central to involve in the workshops.

Respondents B and D (2015) describe a slightly different approach to workshops. First, the group sometimes attends different fairs and technical forums, which might inspire new ideas. Thereafter, the group assembles new experiences and learning in an unstructured brainstorming in the coffee room or similar (Respondents B & D, 2015). If their team discovers something that might be of interest Respondent A or Respondent B call to a more structured meeting to identify specific valuable ideas (Respondent B, 2015). Respondent B (2015) would like to see more structure however, without hampering open discussions. With a lack of structure, ideas and projects might disappear and subsequently not receive prioritization (Respondent B, 2015). Respondent B (2015) states, allocating time and planning innovation meetings well in advance will create a consistent approach to innovation and enhance idea generation, and capturing innovation opportunities.

Moreover, workshops are not necessarily proficient if the participants lack the ability to visualize the problem and the ideas. *"Most people are a lot about text, and cannot share their ideas in a good manner"* (Respondent I, 2015). Therefore, Respondent I (2015) believe it could be a good idea to present ideas in a professional and visual way, so companies do not overlook ideas because of insufficient presentation skills. However, the product development department did attend some training in idea generation tools, although the utilization of them is close to nonexistent.

4.3.2 INNOVATION JAM

OMD did not utilize the innovation jam concept (Respondents I & K, 2015). However, OMD did have a Dragons' Den concept (Respondents I & K, 2015). A Dragons' Den concept is a tool for employees to present their ideas to an innovation committee, who will decide if the idea is worth pursuing (Respondent I, 2015). In turn, the committee should not consist of only experts; it should be diverse and open to support new ideas (Respondents G & K, 2015). Respondent I (2015) emphasizes the importance of seeing the ideas' potential and not only obstacles. Respondent I (2015) believes OMD should introduce improved versions of Dragons' Den, more open to new areas. Further, Respondent I (2015) highlights the significance to see value from the idea even if it lacks clear connections to the core business.

Another term used for Dragons' Den is innovation board. Respondent K (2013) explains the problem with innovation boards is that they have been too secret. No one knew the innovation board existed, rumors spread the information, and even if they were aware of the concept, the information about it was not transparent (Respondent K, 2015). An additional issue is that even the development process was too secret. Respondent K (2015) explains, *"I have added an idea to dragons den however, it felt like it was given to a black hole and nothing happened".*

Respondent B (2015) did hear about a common innovation platforms, and databases within the intranet, for innovation within OMD. However, no one communicated and spread information about these platforms, and Respondent B (2015) never utilized them. Respondent D (2015) states they utilize databases and give access to employees depending on their expertise and competences for continuous improvements. Other employees possessing access to those databases are the factory manager, the management team, and some in process development. They have a forum where they gather ideas (Respondent D, 2015). The forum accountable can further share information about the projects with other factories - if they specifically ask for it (Respondent D, 2015).

In contrast, Respondent N (2015) states the company had several innovation jams related to product innovation, with the first one about four years ago. The innovation events include one virtual jam, which run two-three times and where everyone can participate by posting ideas on a database. Another event is located in Germany, focusing on sales, manufacturing, and marketing (Respondent N, 2015). Here, they select few topics to generate ideas around, and then a physical workshop. Subsequently, there is a process on incubation and funding of the ideas. The innovation management communicated and continuously marketed the product innovation events on the companywide intranet by campaigning (Respondent N, 2015).

4.3.3 SCENARIO ANALYSIS

Corporate product innovation utilizes scenario planning to unravel future business (Respondent N, 2015). Currently, two approaches facilitate in the planning namely, planning scenarios based on the trends and likelihood for things to happen, and scrutinizing future customer needs (Respondent N, 2015). Scenario analysis does exist at OMD as well; there are departments specifically working with staying ahead of time, foreseeing needs, and trends (Respondent I, 2015). The segments develop roadmaps as a tool to map out what could happen in the future, in order to capture new ideas (Respondent J, 2015). It is all about expanding the limits and borders of the business to seek out new opportunities; however, everything concerns costs (Respondents G, H, & I, 2015). Moreover, Respondent E (2015) believes they work with reviewing the future. However, the main responsibility for looking into the future lies within process development, scrutinizing even further into the future is R&D's role (Respondent E, 2015).

In addition, manufacturing utilized future planning to find ideas on how OMD could structure unmanned stations, automation levels, availability etc. (Respondent C, 2015). It is a continuous process; however, this type of future planning is mostly incremental and progressive development. Respondent C (2015) highlights, *"the problem here is that we know how we do it, and how we did it before; hence the employees close their minds and do not see the radical solutions"*. Respondent C (2015) continues and suggests that by throwing away all they currently know, and think about how they can develop a completely new process, is a good way to approach radical process innovation. Additionally, Respondent E (2015) states they often analyze together with suppliers to review future techniques. Subsequently, they

stay in contact and search the market for the new production technique about every year (Respondent E, 2015). Respondent D (2015) also highlights their work within future visions utilizing strategic brainstorming with freethinking such as *"what does 2020 mean for us"*.

Moreover, on a weekly basis, one of the process development departments scan and search the Internet for new ideas and research within their respective area of responsibility, in order to stay updated about current research and future innovations (Respondents D & E, 2015). On the contrary, Respondent F (2015) is of the opinion that they should focus more on scenario analysis and not only on future technologies. Respondent F (2015) believes a more structured scenario analysis could increase the possibility of receiving resources to pursue the project, to show it is a well though through project worth investing in. Further, some process developers documents their findings and share within the factory (Respondent D, 2015). Similarly, Respondents H and G (2015) proactively work with finding new technologies for future use by visiting fairs and utilizing internal benchmarking.

4.3.4 INTERNAL NETWORKS

There are internal networks for innovation, both formal and informal (Respondents B, E, J, & N, 2015). Respondent N (2015) argues *"we have strong networks, and we find our way around if we need some technical support or we want to innovate in some areas, we know where the experts are"*. Respondent J (2015) is part of a formal network that utilizes a platform called 'Quickr', where employees can share books, files, and other information to encourage innovation. This tool emerged from OMD in France, receiving it by an external consultancy firm, and the tool turned out to be very successful. Respondent J (2015) considers it as a start to an innovation technique allowing communication within innovation. However, this innovation network is not active. Respondents C and H (2015) further argue there are no formal innovation networks at all, and Respondents E and G (2015) are not familiar with any formal networks. Respondent H (2015) express that in general the communication between departments and employees is insufficient. There are committees where they discuss and structure innovation projects however, not necessarily innovation (Respondents B & C, 2015).

Nevertheless, most of the networks at OMD are informal (Respondents B, C, E, & F, 2015). The quality and intensiveness of the informal networks are entirely dependent on the empowerment and interest with each individual (Respondents C & E, 2015). Respondent J (2015) elaborates, even the spontaneous meetings in the coffee room or having lunch with someone is an effective way to receive information and inspiration. Respondent I (2015) utilized an additional method to spark innovative ideas in an informal manner. Respondent I (2015) constructed a small prototype that he placed on his desk and on some of the managers' desks. By visualizing the prototype in a physical form, people who walked into the office and saw the prototype on the desk, started to ask about it and suggest additional ideas to innovate the prototype further (Respondent I, 2015). Respondent I (2015) believes it is all about passion that informal networks consist everywhere. Similarly, Respondent E (2015) highlights the significance of having a closely tied team valuing discussion, where they sit closely and

remain updated on each other's work. Working tightly enables continuous discussions and subsequently they can support in developing new ideas (Respondent E, 2015).

An example is Project 1 expressing one of the major challenges was collaborating across functions (Respondents D & E, 2015). This could be due to unclear areas of responsibility and regarding who does what in the process (Respondent D, 2015). Respondents B, D and G (2015) would like OMD to improve the communication tools for innovation and information sharing across the organization through a database. Such database would have to be more advance than OMD's intranet today, to facilitate cooperation and learning to solve problems and inspire new ideas (Respondents B & E, 2015). Nevertheless, the database could never replace F2F communication, and a combination of both is preferable (Respondent G, 2015). Respondents L and M (2015) suggest gathering all ideas and innovation projects in one large database, and then map and structure them by keywords. In turn, this network should be fully transparent and open to everyone within the company (Respondent M, 2015).

Interesting to note is that Respondent N (2015) is planning to install software or a portal where everyone can post ideas, to further enhance networking. Thus, the responsible managers can sift and structure for the right receiver, make sure there are no duplications and multiple projects for the same idea. A potential issue is that people might be afraid that their ideas could develop into making other factories more efficient, hence shifting work from the local factory, meaning a loss of jobs (Respondent L, 2015).

4.3.5 INTERNAL BENCHMARKING

Internal benchmarking, observing, and learning about manufacturing processes from other departments, is a good idea (Respondents B, C, E, F, I, J, L, & M, 2015). Respondent H (2015) remembers having joined other departments' meetings just to get an understanding of their projects. Similarly, the product department has a 'Go-and-See' concept, where one department observes another department (Respondent J, 2015). To this day, the product development analyzed similar department within work planning. Subsequently, they changed some procedures accordingly. To specify, the department did not strictly copy the other department, rather it provided a lot of inspiration for further innovation (Respondents J & G, 2015). Respondent J (2015) continues, *"it is good to bring in and scrutinize existing solutions. For example, how do the automotive construct their gearboxes? Hence, you try to 'steal' solutions from other departments and industries to avoid inventing the wheel again"*.

Moreover, Respondent E (2015) highlights the internal benchmarking between OMD's local and global factories is insufficient and something they can improve. Respondent L (2015) states, by viewing the process as an outsider and bringing in new information and knowledge, it enhances idea generation and innovation. In similar manner as other respondents, Respondent E (2015) states that it is hard to completely replicate however, it is possible to receive inspiration. Respondent B (2015) works with factories globally and aims to compare and share information and ideas between the different local factories.

Internal benchmarking exists to some extent however, not in a structured manner (Respondent A, 2015). An example of what they do is that they document the efficiency of the different factories to evaluate and identify good techniques and try to spread the knowledge and assemble the most efficient combination of machines (Respondent A, 2015). The collaboration and information sharing relates mostly to spreading innovation and technology; they do not spread and share work processes to the same extent (Respondent B, 2015). OMD possesses factory networks around the globe together with R&D (Respondent C, 2015). However, Respondents C and H (2015) believe it is hard to get hold of R&D for networking purposes, unless the project already is in the pipeline and have a project number. Additionally, Respondent G (2015) states *"by sharing knowledge the departments can save a lot of time by not running research in parallel between departments only because you do not know that another department already developed a solution to it".*

Respondent N (2015) believes is it okay to be open and share ideas, however if it involves confidential fragments then specific information should stay closed. Nevertheless, the people involved should always be able to access the information. Detailed, and potentially confidential, information about projects should come in the incubation phase or development phase, hence not early in the process. Sharing and being transparent is an aim for Respondent N (2015). Respondent N (2015) elaborates, *"we are trying to move there, we are now quite fragmented. We are not in full control; it would be a good idea [to share] and there has been a lot of work around it. We do not see end-to-end, we do not manage end-to-end, and we do not measure end-to-end".*

4.3.6 INTRAPRENEURSHIP

The company encourages time allocation for innovation; however they do not allocate time for unstructured activities (Respondent N, 2015). Most individuals would say yes to allocate time. However, there are structure and budget constraints, which make it possible for some places only (Respondent N, 2015). A suggestion is to perform intrapreneurship relatively structured, for example having a task to come up with ideas, and having the time budget in terms of hours allocated. Employees could have 24h to come up with ideas on a challenge, and subsequently present to the achievement to the manager (Respondent N, 2015).

Respondent I (2015) is not sure if time allocation is valuable, as the managers must force people to be creative, which might not be possible. Respondent L (2015) believes allocating time on a factory level might not be sufficient, however probably more suitable for a more corporate level. Respondents J and C (2015) believe setting aside time for innovation probably works, especially since some ideas die because there is no time to pursue an initial thought, working freely could enable capturing those ideas as well. Similarly, Respondent G (2015) believes in allocating time for innovation, however not individually. If the team allocates time for innovation, and pursue it by discussing and helping each other, they can obtain a holistic view and be better at innovation (Respondent G, 2015). Respondent J (2015) believes in continuous conversations with the employees, e.g. "*name 5 things that are*

bothering you". Hence, the conversation is not a lose brainstorming or workshop; the problem solving or innovation takes another path (Respondent J, 2015). Moreover, innovation should be seen as parallel to day-to-day work and hence be indirect; it is preferable not to schedule and control innovation (Respondent C, 2015). However, it is difficult to engage in innovative activities as the daily workload takes up too much time (Respondent J, 2015).

Previously, the product development department had some 'Suggestion Activities', currently called quality improvement within the product department. The factories had something similar to suggestion activities as well (Respondents B, E, & L, 2015). Through those activities, employees and projects received funding, as manufacturing machines are expensive. Nevertheless, that funding does not exist anymore, and in turn, it removed some incentives for idea generation (Respondents E, J, & M, 2015). Focus lied in monetary rewards, which is not ultimate; people want recognition and acknowledgement.

The 'Suggestion Activities' did not always bring value, and was very time consuming (Respondents E & M, 2015). Employees do not often recognize ideas before someone ask them specifically. The 'Suggestion Activities' were mostly for operators, who do what the process says. "*They do not have the mindset to innovate*" (Respondent E, 2015). It is a lot about their job description, in order to prioritize innovation it must be part of it (Respondents B & G, 2015). Respondent B (2015) states 90 percent of the ideas actually come from their level and down the organization. In turn, the innovative mindset exists close to manufacturing; however as innovation is not their job it is 'killed'. Previously, production managers talked a lot with the employees and thereby discovered ideas (Respondent E, 2015). Respondent E (2015) believes many ideas are lost in the factories and hence, it would be good to frequently include time to evaluate your own process. The challenge with this is that employees do not realize their innovative potential (Respondent E, 2015).

Respondent E (2015) states triggering ideas is fuzzy, and to encourage innovation their department once initiated a concept called Creativity Hour, which they held every Friday. For example, one person within the team discovered a completely new manufacturing tool, utilized in another industry. Thereafter the team analyzed it and looked into the possibility to adopt something similar at OMD (Respondent E, 2015). However, Creativity Hour is no longer part of their schedule. Respondents D and G (2015) highlight the need for time allocation, allowing for annual or biannual meetings, as there are no such incentives today. Allocating time effectively would improve the quality of the time spent; *"instead of sending the wrong five people to a fair, they can assemble the right cross-functional group, which should have an output requirement*" (Respondent G, 2015). For innovation Project 4, OMD assembled a group who allocated time to idea generation (Respondent C, 2915). This turned out to be a very successful approach as it generated 27 patented ideas, some already implemented, and some are still in the pipeline. The highlight from this project is the positive effect, which time allocation had on the idea generation phase (Respondent C, 2015).

5 ANALYSIS

The analysis braids together the theory and empirics following the same structure as previous chapters. The theoretical framework provides a general perspective of idea generation, whereas the empirical findings display OMD's work and thoughts within the field. The purpose with the analysis is to provide reasoning behind the answer to the research question. The outcome is a table demonstrating similarities and contradictions between theory and empirics.

5.1 SETTING THE SCENE

5.1.1 PROCESS INNOVATION

Innovation is according to theory, something new to the world and changes what firms offer to customers (Dodgson et al., 2008; Hill & Jones, 2014). The definitions presented by theory and the respondents are rather in line, as the respondents at OMD have similar views on the definition of innovation. Some reoccurring explanations are that innovation is bringing two or more very different things together, and introducing something new in a different environment and setting (Respondent D, 2015). It is also a new solution to an old problem (Respondent A, 2015), and it is about thinking outside-the-box (Respondent F, 2013). It is important to clarify that the respondents all have a similar views on innovation, decreasing misunderstandings and ensuring understanding of the topic.

Moreover, the OMD respondents and Respondent N (2015) do not believe the approach towards innovation is different depending on if it is product or process innovation. Process innovation for manufacturing is often similar to product innovation as it comes down to machines and parts of the production line (Respondent A, 2015). However, Respondent N (2015) states the only differences between product and process innovation mainly lies in the final customer. According to Respondent N (2015), the more important customer is the end-customer buying the final product and not the factories that are internal customers to process innovation. Therefore, the company focuses more on product innovation than on process innovation. Hence, OMD places less attention towards process innovation. According to Respondent N (2015), this distribution of resources is understandable and logical. The OMD respondents believe more focus should be towards process innovation compared to today.

Theory states that in mature industries with relatively mature products firms should shift focus from product innovation towards process innovation (Dodgson et al., 2008). For firms in such mature stages, process innovation is central to staying competitive on the market (Dodgson et al., 2008). As respondents consider OMD to be in a mature stage, both industry-wise and product-wise with long product life cycles, provides reason for process innovation. Additionally, Utterback and Abernathy's (1975) PLC portrays process innovation to be pre-dominant in mature stages. However, even if process innovation deserves more attention than product innovation OMD argue they must obtain top management support to carry out process innovation. Top management support should come from direct managers and further up the

hierarchy. Many respondents seem to be of the opinion that this is not the case and subsequently hindering process innovation from certain levels.

5.1.2 THE INNOVATION PROCESS

Respondent N (2015) believes radical innovation work performed on a corporate level is preferable and incremental innovation is more appropriate for operators and employees working closer to the factory. The respondents who work directly on a factory level are also of the opinion that they develop incremental ideas rather than radical. However, radical innovation projects show that innovations emerge from all levels of the organization. Additionally, corporate Respondent N (2015) agrees that ideas can emerge from all levels of the organization. The majority of OMD respondents highlight there are many ideas however, OMD lacks the structure to work with it. They also believe the innovation process is inadequate and that they lack implemented processes for triggering process innovation. Respondent N (2015) confirms this apprehension, as OMD today does not have a specific person, team, or department who possess any direct responsibility for process innovation. Radical process innovation ideas can emerge from those close to the process however; there is no process for how to deliver and how to go about radical process innovation (Respondent N, 2015). Nevertheless, a structured process is present for product innovation.

5.2 TRIGGERING RADICAL PROCESS INNOVATION

5.2.1 WHERE DO INNOVATIONS COME FROM?

Tidd and Bessant (2014) explain innovations as a phenomenon not necessarily occurring by chance. Triggering innovation by systematically searching for them can increase innovation within a firm (Drucker, 2002). Most respondents agree with this view of systematically being able to trigger innovation amongst teams and employees. However, other respondents believe innovation cannot emerge by force; rather, innovations emerge by chance (Respondent C, 2015). Nevertheless, this apprehension connects closely with the view of Tidd & Bessant (2014), saying that accidents, regulations, and other unexpected events trigger innovation. Further, both theory (Tidd & Bessant, 2014) and empirics emphasize the different sources of innovation, and how innovation emerge through exposure to new environments, inspiration from other departments, and when facing problems.

In addition, the respondents express concern about the interface and collaboration with the R&D department, which they say hamper innovation. The hampering evolves from R&D not prioritizing factories' ideas, not looping information and feedback, which makes the process developers unable to follow the progress of what is currently in the pipeline. Moreover, it is an important incentive for idea generation to be able to follow the ideas' progress throughout the processes. Respondents highlight that employees must comprehend the operative business

in order to get a deeper understanding of potential process innovation for manufacturing (Respondent A & L, 2015). This could be because people familiar with the manufacturing process are more likely to develop a process innovation with higher potential of acceptance by other users (de Jong & de Bruijn, 2015). Respondent N (2015) questions weather it is efficient to allocate innovation resources to those close to the process. *"It is not a question about hierarchy rather about efficient resource allocation"* (Respondent N, 2015). Tidd & Bessant (2015) state that employees present in day-to-day operations enhance process innovation.

Similarly, respondents within OMD believe ideas are present within the employees' minds; however, the trick is to capture the ideas and encourage the employees to share. Likewise, not knowing how to proceed with an idea is a major drawback (Respondents, A, B, C, L, & M, 2015). The operators do have good ideas, and by having a clear process for developing the ideas, the capturing and further developing of the idea would be much easier. The documentation of the ideas and problems seems to be a major issue for OMD. Respondents working with process development and operators emphasize the need for a common database for filing and searching for other factories' and departments' problems, ideas, and projects.

5.2.1.1 INCENTIVES FOR IDEA GENERATION

The case study emphasizes a central part of triggering radical process innovation to be incentives. Not only a lack of structure however, also flaws in how to motivate and create incentives for employees to innovate. The empirics show that monetary rewards can be of importance. However the major encouragement for employees to innovate is through intrinsic rewards, namely acknowledgement, being part of the development, adding value, and seeing their own ideas implemented (Respondents A, B, C, D, E, F, G, H, I, J, K, L, M, & N, 2015). When they hand ideas over to the receiver, which in many cases is R&D, ideas tend to disappear into a black hole, either never heard of again or only limited information, and updates are available. In turn, this decreases the intrinsic motivation to share and spread ideas. Additionally, giving credit to the right person is also important.

A concern expressed by both product and process developers is the quantitative patent focus. Hence, employees might receive acknowledgement, however they miss out on the development, the adding value, and implementation. Respondent N (2015) supports this reasoning by admitting that monetary rewards and patent targets might measure the wrong things. Monetary rewards are important, however sometimes they show to encourage short-term thinking, as the ideas get stuck in the patent phase without development and implementation. Since development, adding value, and implementation are the greatest incentives according to empirics, patent targets might not be the way to trigger innovation.

5.3 ACTIVITIES AND SUCCESS FACTORS FOR IDEA GENERATION

The analysis below features the activities and the success factors for OMD's triggering of radical process innovation within manufacturing. After analyzing each activity, a table visualizes the success factors for that specific activity. It implies how well OMD carries out

each activity and indicates the status of each success factor. The green check mark indicates acknowledgement and presence of the success factor, the tilde sign means that OMD acknowledges the success factor, however do not execute it fully. Finally, the red cross implies that the success factor is non-present within process innovation at OMD. After presenting all activities and their success factors a summarizing table shows an overview of the success factors. To clarify, OMD in the tables refers to the division within a company. Hence, even though the company utilizes some activities, OMD does not necessarily.

5.3.1 WORKSHOPS

Theory states workshops are a proficient management tool, which companies utilize to manage difficult and fuzzy problems or tasks (Geschka, 1986). Most respondents confirm workshops are present within OMD, however, not in a systematic manner. Workshops are also the activity, which most departments and teams adopt. However, given the answers from the interviews, the workshops lack structure and they do not apply them in a systematic manner. Executing workshops in a systematic manner improves problem solving, idea generation, and building on other ideas (Geschka, 1986). The respondents' major challenges are to find the time to organize and attend workshops, as it is impossible to ensure a valuable outcome. As theory (Geschka, 1986) emphasizes the value in utilizing workshops, allocating time for workshops and providing a structure for it might facilitate the idea generation phase.

5.3.1.1 ATTENDANTS

The number of participant in a workshop can vary; the respondents' express different numbers of preferred participants. However, all respondent believes the groups must be diverse and contain different competences and experiences. Similar to theory, groups should consist of between five to twelve participants who possess unique and broad knowledge connected to the problem or task. The group should also include participants from all organizational levels (Geschka, 1986). Nevertheless, when asking about how they assemble groups OMD respondents seem to assemble people they know from their personal network for the workshops. It can therefore be questioned whether-or-not the group is truly diverse. In addition, some respondents express frustration in that the same ideas and outcomes often emerge during several workshops and they end up discussing similar ideas.

Respondents therefore agree that the facilitator plays a key role, carrying the responsibility to ensure a valuable outcome and workshop session. Similarly, Hurt (1994) presents theory regarding the importance of a competent facilitator to encourage and challenge new ideas. OMD respondents believe it is all about having the right innovative mindset and the facilitator holds the responsibility of trying to implement that mindset. According to both theory (Hurt, 1994) and empirics, the facilitator should define the goal or problem clearly before the workshop starts. Empirics also emphasize that it is the facilitator's job to ensure a creative and non-judgmental environment. This is something some respondents' value and emphasizes OMD to improve. In the past the facilitator role was either a technical engineer or a project

manager, there were two challenges with this. First, if the project manager was solely a project manager they lacked the knowledge about technical details. Second, if the project manager was a technical engineer they lacked the project management skills. However, Respondents H and G (2015) presented a solution to join a so-called 'technical lead' and a project manager to balance each other's competences.

5.3.1.2 BRAINSTORMING TOOLS

The product development department gives examples on tools, which they use from time to time (Respondents I, J, & K, 2015). Likewise, the process development department also provides information about IT tools and methods facilitating their workshop. All respondents emphasize the importance of post-its and visualizing their ideas in order to allow for feedback. To enumerate, Respondent I believes *"most people are a lot about text, and cannot share their ideas in a good manner"* (Respondent I, 2015). Some of the departments read up on topics before initiating workshops and brainstorming sessions by attending fairs and technical forums. Thereafter, if needed, they call for a more structured workshop after the initial, unstructured brainstorming session. Most respondents believe the tools facilitate and enhance value and efficiency of workshops. Even though OMD utilizes several different methods and tools for idea generation, they do not use them frequently and the knowledge and awareness of the different tools is low. Most respondents are content with how they handle the tools, even though it could always improve.

A concern surfacing is the balance of control. Today, some departments utilize brainstorming activities solely by chance in the coffee room or similar. In turn, the department could end up losing fruitful discussions and subsequently ideas and elaborations. By planning meetings in advance a couple of times a year could help improve structure within OMD (Respondents B, D, & G, 2015). Today, unstructured and sporadic brainstorming sessions foster creativity and an innovative environment within some of the departments. However, ideas do not receive the prioritization they deserve as no one documents them (Respondent D, 2015; Respondent B, 2015). In contrast, structured meetings capture ideas and someone might document the ideas.

Nonetheless, it is evident that the departments utilize the tools sporadically and in an unstructured manner. Hence, the workshops OMD carry out, varies in quality and outcome. Subsequently, the unstructured nature of the workshops results in OMD losing ideas and potential innovation projects (Respondent B, 2015). Due to the different and unstructured approaches, it is difficult to identify practice regarding workshops within OMD.

Activities	OMD	Success Factors	OMD
Workshops	✓	• Assemble diverse groups	~
		• Clearly formulated task	✓
		• Open and non-judgmental environment	✓

Table 5: Success Factors for Workshops

✓ Present
✗ Non-present
~ Ambiguous

5.3.2 INNOVATION JAM

An innovation jam is a massively parallel online conference, aiming to reach a broader scope (Bjelland & Chapman-Wood, 2008). Empirics portray different opinions about whether OMD had innovations jam in the past or not. Respondent N (2015) clearly states that the corporate level initiated several innovation jams over the last four years. The jams at the company allowed participants to post product innovation ideas through a database, which is essential according to theory (Bjelland & Chapman-Wood, 2008). Respondent N (2015) further emphasizes major campaigns that aimed to bring awareness to the jams. Respondent N (2015) believes the turnout and participation rate were successful, and many ideas added value to the firm. Conversely, the product development team did hear about the innovation jams and Dragons' Den concepts; however it was mostly through rumors (Respondents I, J, & K, 2015). Hence, it contradicts Respondent N's (2015) previous statement that all employees were aware and could participate in the jams. To specify, the previous jams exclusively concerned product innovation. Even though the company encouraged all employees to participate, none of the process developers had any awareness of the events (Respondents A, B, C, D, E, F, G, & H, 2015). According to theory, one of the main purposes with innovation jam is to access a larger scope, and if failing to do so there is no purpose of having innovation jams (Bjelland & Chapman-Wood, 2008).

Respondent N (2015) explains there is knowledge about how to structure and manage an innovation jam, as they conducted innovation jams for product innovation before. Hence, there is a foundation for a process innovation jam to build on. However, it might be difficult to involve the entire company, as technology specific knowledge might be necessary to come up with valid ideas. Respondent N (2015) is of the opinion that it is only efficient for corporate levels to work with radical process innovation. Nevertheless, Respondent N (2015) and many other respondents believe there are several ideas emerging from all levels of the organization. However, it lacks structure to trigger and capture it. It might seem contradicting, as respondents believe ideas emerge from all levels within the organization and Respondent N (2015) recommends processing ideas centrally.

The secretiveness and lack of transparency is a discouraging factor influencing the willingness to contribute to for example the Dragons' Den. Submitting ideas and not knowing what happened to them is not motivating (Respondent J, 2015). Linked to the lack of transparency is the existence of the previously mentioned databases. A few process developers were aware of a common database; however there is only restrictive knowledge about it, and they do not know how to utilize and exploit it (Respondents B & D, 2015). Additionally, the common databases on factory levels also restrict access to high-level managers only.

Nevertheless, the database applied to the first innovation jam turned out to be insufficient as it failed to handle all the information put through the portal (Respondent N, 2015). After some adjustments to the portal, it should cover future needs for an innovation jam setting. However, if OMD decides to enroll in a similar setting as the Dragons' Den this portal might need to allow more transparency. The transparency showed to be one of the major incentives to

sharing your idea and OMD might need to prioritize it. If OMD incorporates a Dragons' Den for process innovation it might require an adjusted composition of judges and participants as process innovation might entail more technological aspects.

Activities	OMD	Success Factors	OMD
Innovation Jam	✗	• Thoroughly developed goal	✗
		• Reach a broader scope	✗
		• Platform allowing for interaction	✗

Table 6: Success Factors for Innovation Jam

✓ Present
✗ Non-present
~ Ambiguous

5.3.3 SCENARIO ANALYSIS

Theory explains that exploring and evaluating future scenarios help firms prepare for upcoming challenges, and in turn help them to stay ahead in innovation (Bessant & Francis, 2005; Mercer, 1997). Respondent N (2015) informs that the company does not utilize scenario planning for innovation specifically, rather the strategy department focuses on scenario planning. However, this would be nice to have for innovation. Warren (2012) argues about the importance to include operational constraints and realities, and pay less attention on operational details. OMD respondents clearly emphasize the challenge of letting go of what they already know and think outside-the-box by ignoring operational details and exploring radical solutions. In other words, theory and empirics show similarities in valuing operations for future scenario planning, rather than specific operational details. Moreover, the process development departments often attend fairs and utilize suppliers to review future manufacturing techniques, which are in line with theory (Tidd & Bessant, 2014). However, Respondent F (2015) believes themselves to have misplaced the focus, as they concentrate on future technologies rather than the scenario analysis itself. Respondent F (2015) further sees opportunities in having a structured way of approaching scenarios, as it would be the foundation and evidence for why they should pursue some investments.

The different departments have diverse opinions about who is responsible for conducting scenario analyses. Different respondents specify different teams and departments to be responsible for future scenario planning (Respondents A, B, D, E G, & H, 2015). In addition, some teams carry out scenarios, even though they do not believe it is in their role. Hence, it is unclear who should be responsible, and the work around scenarios appears scattered and unstructured. Warren (2012) highlights the significance of viewing the organization holistically and not function-by-function, as it hampers transparency and overlooks interdependencies and their effects. Today OMD carries out scenario analyses function-by-function, and even though OMD seems to understand the importance of unraveling future trajectories, they do not organize the activity in a systematic manner according to theory (Mercer; 1997; Warren, 2012).

Activities	OMD	Success Factors	OMD
Scenario Analysis	~	• Highlight core purpose and field	~
		• Focus on operations, not specific details	~
		• Viewing the organization holistically	✗

Table 7: Success Factors for Scenario Analysis

✓ Present
✗ Non-present
~ Ambiguous

5.3.4 INTERNAL NETWORKS

Large networks increase diversity, help sharing across functions, and enhance radical innovation (Savoia & Copeland, 2011; Tidd & Bessant, 2014). Internal networks improve innovation as it connects different departments, enabling them to collaborate and operate in a less silo-focused manner, and it enhances the possibility for departments to work towards a common goal. Hence, even though some departments have discussions in the coffee room, it might not be enough to obtain sufficient diversity and cross-functional collaboration as theory suggests (Tidd & Bessant, 2014).

Theory portrays two types of innovation networks namely engineered and emerging (Tidd & Bessant, 2014). With more actors involved in the network, it becomes complex, which in turn results in extensive potential for radical innovation (Tidd & Bessant, 2014). Even though theory highlights engineered networks as significant, OMD's process development respondents are not part of any engineered or formal networks. However, some respondents believe it might exist within the company. The product developers participate in engineered networks to some extent; however, most of the networks are stagnating, and rarely updated and used (Respondent J, 2015). Nevertheless, emergent networks acquired through own self-interest is common for all respondents, both product and process development. Similarly, Respondent N (2015) believes all employees who need technical support or want to innovate in some areas know which experts to contact. However, the OMD respondents do not believe it is clear who to turn to and how to proceed with ideas.

Moreover, OMD respondents highlight that the initiative to manage personal relations is up to each employee. Emergent and engineered networks are not something OMD or managers encourage explicitly. Whereas, theory emphasizes the importance for firms to facilitate and encourage the internal innovation network process, they must initiate engineered networks, detached from interdependence and other mutual interests (Tidd & Bessant, 2014). Well functioning engineered networks could clarify whom to contact when an idea emerges. Additionally, the respondents wish to see more initiative from higher levels to allow and facilitate networks and communication between departments and across functions.

In order for OMD to realize the benefits with innovation network, and work cross-functionally and towards a common goal, theory suggests to work actively with allowing and facilitating for open communication. Complex and extensive networks can both benefit from having enhanced information flow through shared meeting points, knowledge management

systems, and databases (Björk & Magnusson, 2009; Tidd & Bessant, 2014). Correspondingly, respondents surfaced the need for common databases and showed awareness of further potential to share and collaborate within OMD. Even though databases and communication tools never can replace F2F communication, it can improve transparency and reduce the silo-function manner. Respondent N (2015) acknowledges the need for a database and shared plans indicating the launch of a new portal for idea sharing.

Activities	OMD	Success Factors	OMD
Internal Networks	✓	• Allow for emergent networks	✓
		• Compose engineered networks	~
		• Cross-functional collaboration	~

Table 8: Success Factors for Internal Networks

✓ Present
✗ Non-present
~ Ambiguous

5.3.5 INTERNAL BENCHMARKING

Internal benchmarking is the process of identifying, sharing, and utilizing internal knowledge and practices (Southard & Parente, 2007). It is also something all respondents are very positive towards and something they consider a valuable source of information. Respondents express that teams and departments within OMD had some kind of internal benchmarking activities in the past, however this is not active today. Respondent J (2015) explains, *"it is good to bring in and scrutinize existing solutions. For example, how do the automotive construct gearboxes? You try to 'steal' solutions from other departments and industries to avoid inventing the wheel again"*. The majority of respondents are of the opinion that internal benchmarking inspires innovation. This is fully in line with Ronco (2012), who argues that by comparing and sharing processes and practices, opportunities for new ideas to emerge.

However, for internal benchmarking to be successful, cross-functional collaboration and communication is key (Ronco, 2012). Further, organizations operating in a silo-focused manner will not obtain the ability to benefit from internal benchmarking (Ronco, 2012). Today, the information and knowledge shared between departments and functions is limited and mostly focused on technology, not on processes or innovation. As respondents perceive communication and collaboration across functions to be insufficient and highly difficult, they consider that internal benchmarking needs improvement. Theory presents a major disadvantage regarding internal rivalry and competition between departments (Ronco, 2012). Respondent M (2015) highlights an evident drawback concerning hesitation to share certain ideas as it might give another department advantages. Coupling theory and empirics show issues and potential obstacles when departments are reluctant to share. Nevertheless, Respondent N (2015) and many respondents are open to the thought of sharing knowledge and information. However, the major drawback is the lack of knowledge in how to do so.

In addition, Respondent N (2015) agrees internal benchmarking is important, even though some specific information might have to be confidential. Sharing and being transparent is an aim for Respondent N (2015). Respondent N (2015) elaborates, *"we are trying to move there, we are now quite fragmented. We are not in full control; it would be a good idea [to share] and there has been a lot of work around it. We do not see end-to-end, we do not manage end-to-end, and we do not measure end-to-end".* To emphasize, both OMD respondents and Respondent N values internal benchmarking, yet there is an evident gap between what they desire and what they currently do.

Activities	OMD	Success Factors	OMD
Internal Benchmarking	✓	• Cross-functional structure • Accessibility	~ ✗

Table 9: Success Factors for Internal Benchmarking

✓ Present
✗ Non-present
~ Ambiguous

5.3.6 INTRAPRENEURSHIP

Intrapreneurship is entrepreneurship activities taking place within an existing organization (Antonic & Hisrich, 2003). On a corporate level, the company encourages time allocation for innovation however, managers should structure the activities e.g. through challenges (Respondent N, 2015). As mentioned previously, process innovation does not have a specific process, nor does corporate innovation believe time allocation for process innovation is efficient. In addition, Respondent L (2015) does not believe in time allocation on a factory level. Nevertheless, theory links process innovation and intrapreneurship together tightly as analyzing and improving production procedures and techniques can significantly improve a firm's performance (Antonic & Hisrich, 2003). In contrast, empirics show different opinions whether it is valuable to allocate time for process innovation or not. Some of the respondents are skeptical about forcing innovation and do not believe it is possible for managers to compel their employees to innovate (Respondents C & I, 2015). Other employees would like to see collateral goals for teams or departments, as individual time allocation for innovation, as they will miss out on vital discussions and teamwork (Respondents B & G, 2015). Yet another opinion came from Respondent C (2015) who strongly emphasizes innovation to be parallel to day-to-day work, and not schedule and control it (Respondent C, 2015). An analysis of Project 4 surfaced evidence of highly successful innovations emerging from complete freedom in the idea generation phase.

Most opinions boil down to viewing time allocation as valuable. However, the vast majority emphasizes the significance to structure the freedom in one way or another. One reason evolves from the belief that having too much freedom would impact the day-to-day operations (Respondents D, E, G, I, L, & N, 2015). Linked to the day-to-day operations is lack of time;

today most respondents do not have time to pursue own ideas and projects, as they are busy as it is. In addition, most respondents believe it hampers innovation if they are not able to spend time and resources on idea generations. In essence, the respondents believe time allocation is good for innovation. In contrast, some of the respondents do either not believe they have time, or they do not think it is appropriate, to include time allocation for innovation in their process development roles. Hence, there are evident contradictions in the opinions, as they believe freedom creates opportunities for innovation, yet they do not prioritize it.

There have been initiatives in the past to encourage idea generation, and subsequently rewarding and funding the best ideas. Both product development and the factories had 'Suggestion Activities', allowing employees to submit own ideas for evaluation and further development. However, due to incentives mostly focusing on quantity in order to receive monetary rewards, it was not as successful as it could have been. Hence, focus did not lie in acknowledgement and recognition, which are the most important incentives for innovation according the OMD. In addition, the administrative work around the factories' 'Suggestion Activities' became too heavy. With many ideas submitted only to receive monetary rewards, the quality and subsequently the result became very poor.

A successful activity in regards to intrapreneurship and time allocation is one of the process development teams 'Creativity Hour'. The concept took place once a week and the participants read up on their subjects in beforehand. The discussions were often rich and served as an encouragement for triggering ideas. Unfortunately, the concept is not present in their day-to-day operations anymore.

Activities	OMD	Success Factors	OMD
Intrapreneurship	✗	• Prioritize time for idea generation	✗
		• Prioritize resources for idea generation	✗

Table 10: Success Factors for Intrapreneurship

✓ Present
✗ Non-present
~ Ambiguous

5.3.7 PARADOX

Vital information about managerial aspects of triggering the process emerged from empirical findings. Later, when coupling empirical managerial issues with theory, the significance of their importance for process innovation became apparent. Additionally, comprehending these issues is inevitable if wishing to gain a holistic view of the triggering phase. Björk et al. (2010) developed their framework for continuous innovation, and their conclusions derived from researching firms working with different types of innovation. However, it was possible to apply them to radical process innovation at OMD as well. Hence, the framework of Björk et al. (2010) is also relevant for radical process innovation.

5.3.7.1 PARADOX 1: STRUCTURE

Björk et al. (2010) state firms should consider balancing formal and informal practices. Brown and Duguid (2000) further emphasize that firms can overlook innovative opportunities if they rely too much on processes. On the contrary, if practices are too informal the firm can fail to capture emerging ideas (Björk et al., 2010). Respondents have different opinions of how well structured the innovation process and idea generation activities should be. Further, some respondents see innovation a structured way of working rather than a happening. Respondent B (2015) further emphasizes that without a structure the firm fails to capture ideas generated from a very informal environment. However, many respondents explain that the process innovation structure is inadequate. In general, OMD must be better at triggering and generating ideas, and they need to have an organizational structure supporting it (Respondents B, 2015). On the contrary, some respondents believe ideas emerge by chance and from unexpected exposure. One opinion is that forced ideas, structure, and steering are not always effective as it can hamper creativity (Respondent C, 2015). However, most respondents still express a need for some kind of structure, even in unstructured events. Similarly, theory states it is vital to balance formal and informal practices to both trigger and capture ideas (Björk et al., 2010).

When organizing and structuring for process innovation, theory shows there are many different approaches to consider (Davenport, 2013; Dodgson et al., 2008; Tidd & Bessant, 2014). To enumerate, firms should reflect over openness to innovation, and balancing control and autonomy. Moreover, Tidd & Bessant (2014) believe firms benefit from applying both best practice and internal methods to enhance innovation. Similarly, OMD believes open and spontaneous environments help trigger innovation, and structure mitigates losing ideas. Additionally, Respondent B (2015) highlights the importance of balancing control and autonomy in like manner as theory.

Moreover, too informal processes tend to lack transparency, cause inefficiencies, and issues in control (Björk et al., 2010). The case study identifies considerations about the same problem appearing in different departments and being solved multiple times. More structure and formality could increase transparency and control, which facilitates sharing information. In turn, sharing information enables OMD to solve the same problem once and avoid spending unnecessary time and resources. Employees who generated good ideas might not possess the network or competencies to further develop it (Björk et al., 2010). An example from empirics is that respondents believe there are many ideas and that they possess the right mindset and creativity. Nevertheless, after developing an idea, they do not know how to proceed (Respondent M, 2015). Further, Respondent L (2015) states, *"in the best of worlds, we would know exactly how to document and pursue with the ideas, and then when there is time and no acute problems, we can dig into the database and unravel those ideas into innovations".* One major issue OMD holds today is the insufficient structure of spreading and sharing knowledge (Respondents B, L, & M, 2015). In addition, Respondent A (2015) states OMD's strength is execution and fail to have proper documentation and structure for idea generation and process innovation. To link back to theory, Björk et al. (2010) emphasize that more formal processes

can mitigate similar problems. Additionally, engineered networks can facilitate the spreading of knowledge and understanding of who to turn to (Tidd & Bessant, 2014).

Boedrick (2014) highlights group-generated innovations; similarly, the respondents articulate the importance of interface when developing ideas. Nonetheless, the overall communication and collaboration between diverse people, with different background, and from different departments seems inadequate. More specifically, the different departments working with process innovation appears to function in a silo-focused manner (Respondents, A, B, C, D, E, F, G, & H, 2015). Hence, lack of transparency exists within the communication and feedback process. After delivering an idea to the receiver or another department, the information-flow stagnates (Respondent B, 2015). However, if OMD had a structured and formal way to communicate and proceed, departments and employees might be more transparent.

5.3.7.2 PARADOX 2: FREEDOM

Paradox 2 concerns freedom for idea generations (Björk et al., 2010). If the task or innovation area is too narrow and specified, narrow ideas will inevitably be the outcome. Conversely, an entirely open field for innovation is not convenient when aiming at obtaining useful ideas as they might become too shallow and lack core business connections (Björk et al., 2010). Most of the OMD respondents and Respondent N on a corporate level emphasize the importance of having clearly formulated problem statements and challenges. Even though, some of the respondents do not mention clear problem statements and challenges, they still believe it is important to identify a field or topic for innovation. This line of reasoning is important, as having a set field for innovation facilitates the subsequent steps in the innovation process (Björk et al., 2010). In addition, empirics and theory also agree on that a narrow focus secures ideas within the desired field (Björk et al., 2010; Geshka, 1986).

However, theory identifies consequences for firms limiting the scope and freedom too much, and only focuses on specific tasks (Björk et al., 2010). For example, conducting challenges as Respondent N (2015) expresses to be specific rather than generic open discussions could make them overlook opportunities residing from outside the firm. Moreover, as idea generation activities often take place within an existing innovation project team, the freedom is limited from the very beginning. On the contrary, if the innovation projects emerged from an idea generation activity the scope is broader and allows for more radical ideas. Hence, OMD should be aware of this issue and balance or vary in the way they are approaching the level of the innovation freedom. Another risk affecting the freedom of the innovation is the involvement of specialists as they have a tendency to see limitations rather than opportunities, (Respondent J, 2015). Theory states that groups should not consist of too many specialists, as they tend to reduce the innovation scope by holding on to the ‘status quo’ (Hurt, 1994). Specialists tend to only see limitations and might have a negative approach towards new ideas. In turn, this could decrease the amount of radical ideas and have a negative impact on process innovation. However, OMD cannot eliminate the specialists as process innovation might require technological knowledge. Therefore, it is important to find specialists who think radically and possess an open mindset in order to not limit the scope and freedom.

5.3.7.3 PARADOX 3: INVOLVEMENT

The third paradox questions the level of involvement, if the company should involve of all parts in the company or not (Björk et al., 2010). Involving a large number of employees will naturally result in more ideas, which could become difficult to manage. On the contrary, fewer participants result in fewer ideas, which limit the span of ideas (Björk et al., 2010). Moreover, when deciding on the number of people involved, diversity is important. The assembled groups are according to respondents diverse in terms of mixed competences and experiences. Some OMD respondents believe the groups are diverse however, as the groups always consist of the same constellation the variety of outcomes are low. This argues for the groups not being diverse or fulfilling the purpose of outside-the-box-thinking. Moreover, theory also adds if the groups are too narrow it can hamper radical innovation (Björk et al., 2010).

Today, OMD respondents present the level of involvement in process innovation throughout OMD to be low. The process development department seems to be those working the most with idea generation activities. Tidd & Bessant (2015), state that employees working with the process itself are more likely to innovate, which carry a higher potential of acceptance from other users. Hence, OMD could benefit from including operators in idea generation activities from time to time. However, one of the challenges for employee involvement is to find time and resources for idea generation and process innovation. Therefore, top-management must support the allocated time, otherwise there will be no time except from everyday operational activities.

Communication and cross-functional collaboration is an additional challenge, which affects the level of involvement at OMD. Moreover, it is a huge incentive for OMD respondent to understand and follow the ideas and projects development (Respondents D, E, G, & H, 2015). Hence, OMD should facilitate cross-functional communication allow the employees to stay updated on their ideas, as it could encourage continuous idea generation and knowledge sharing. However, the department responsible for the subsequent phase in the innovation process seems to be operating in a silo-focused manner and exclude other departments from involvement. The general impression is that the information flow within OMD's different departments could improve. Activities such as internal benchmarking and internal networks emphasize involving the larger scope to enhance innovation and idea generation.

5.3.8 HIGHLIGHTS

Derived from the analysis are several activities and success factors, which the coupling of theory and empirics enabled. Below each activity, a table highlights the main success factors, which assure quality of the activities. Moreover, workshops and internal networks are those activities OMD utilizes the most; other activities serve as a foundation for some innovation projects occasionally. However, OMD lacks overall structure and consistency throughout its activities; there is no underlying process or structure. Today, the lack of structure results in inconsistencies in qualitative outcomes. In essence, OMD does not conduct idea generation activities that repeatedly evolve in either many ideas or valuable radical ideas. Hence, the

outcomes' quality and value vary, and at times OMD even sees the activities as time consuming and unnecessary. The analysis serves as the foundation to answering the research question. However, we discovered a deeper issue within OMD's triggering of the process. Even through OMD utilizes some activities; they need additional structure and consistency for its activities to exploit them to their fullest.

By coupling the different success factors of the activities, they naturally formed groups, which subsequently correlates to Björk's et al., (2010) paradoxes: structure, freedom, and involvement. Theory suggests that a firm does not exploit its activities they will eventually be left with the costs of exploration and without any of its benefits (March, 1991). Hence, the quality of the activities relies on the success factors. If the OMD fails to implement the success factors, they might not achieve the wanted outcome.

Success Factors			OMD
Structure	•	Balance structure for projects	~
	•	Database to share projects and innovations	✗
	•	Open and non-judgmental environment	✓
Freedom	•	Balance freedom for projects	~
	•	Clearly formulated task or challenge	✓
	•	Aim high when generating ideas	✗
	•	Viewing the organization holistically	✗
Involvement	•	Assemble diverse groups	~
	•	Cross-functional collaboration	~
	•	High level of communication	✗
	•	Encourage emergent networks	✓
	•	Compose engineered networks	~
	•	Prioritize time for idea generation	✗
	•	Prioritize resources for idea generation	✗
	•	Balance between daily operations and innovation	✗

Table 11: Success Factors for Idea Generation Activities

✓ Present
✗ Non-present
~ Ambiguous

5.4 DISCUSSION

The discussion surfaces the success factors, which are vital for ensuring high quality outcomes from the idea generation activities. It further provides a discussion around the deeper issues within OMD's triggering phase. To ensure good quality for the idea generation activities, the main issue for OMD boils down to the paradoxes structure, freedom, and involvement. In addition to the three paradoxes further called 'decisions', the discussion introduces a fourth decision, 'approach'. This section utilizes the insight gained from the case study to contribute to a larger practical discussion. Additionally, the discussion contributes to academic purposes by surfacing complex managerial problems in structuring process innovation within a larger, incumbent firm.

5.4.1 PROCESS INNOVATION AT OMD

First, the company OMD is part of, has historically focused on product innovation exclusively. Nevertheless, as the industry and the firm are mature and the PLC for the products is very long, it is appropriate to engage in process innovation to gain competitive advantage. The long PLC and product maturity does not force rapid process or product innovation (Utterback & Abernathy, 1975). However, as OMD's long PLC does not require product innovation they have the opportunity to place extensive emphasis on process innovation. In general, OMD and the overall firm seem to lack process innovation focus. Overlooking process innovation opportunities can cause OMD to fall behind in developing technology, cutting costs, and maximizing scale, subsequently hampering competitive advantage (Dodgson et al., 2008).

A reason why the company does not focus on process innovation is because they value product innovation. They base this assumption on the fact that they only view external customers as 'real', profitable customers. Internal customers, such as factories, are also a source of innovation, which can be profitable in terms of cutting costs and increasing efficiency. Nevertheless, even if OMD discovers the value in process innovation they lack a structured process for it. OMD does not receive support for process innovation from the top, which hampers innovation at OMD. If OMD wishes to pursue radical process innovation for manufacturing, they must receive sufficient support from corporate levels, and semi-formal structures and processes (Tidd & Bessant, 2014). As OMD and Respondent N believe there is no difference in approach towards product and process innovation, the competence and knowledge in how to manage innovation is present within the company. Therefore, it should be possible for OMD to enhance collaboration and communication through internal benchmarking and networks, for innovation structure purposes.

5.4.2 DECISION 1: STRUCTURE

The structure and line of action in how to approach process innovation, is OMD's biggest weakness. Nevertheless, it is evident that OMD wishes to approach innovation more systematically through structured processes and procedures, which is promising for future work within process innovation. Today OMD does not have any formal processes, hence leaving them with lack of transparency, inefficiencies, and issues with control. The lack of transparency emerges from insufficient ways of spreading and sharing knowledge among departments and across functions. It boils down to insufficient communication and feedback processes, which seems to result in silo-focused behavior and reluctance to share. As OMD employees do not know how to pursue with ideas, a structure could help OMD overcome inefficiencies. At the same time, a structure could also facilitate OMD's problem to control the triggering and capturing of ideas. A structure could involve working according to a set process, for example Bessant & Francis (2005) suggest the following three phases: triggering the process, select, and implement. The structure should further include directives about roles and responsibilities. In addition, OMD could utilize a database, in which employees search for

existing innovations and problems. If they do not find a solution on the database they should have a clear framework for how to proceed, and finally submit their idea to the database.

Allowing for some kind of structure will most likely help OMD to not lose ideas. However, theory explains firms must balance the formality and informality of the structures. Hence, OMD should obtain a structure, which allows for free thinking and open discussions. The structure should still provide enough formality to mitigate problems related to rigidity. Today, OMD does not structure its activities in accordance to reaching radical innovation and the general impression is that the execution of the activities is random. To specify, OMD does not have a formal way of triggering and capturing radical ideas. Consequently the process is too informal; OMD needs a supportive structure to balance the paradox. Therefore, the outcome of the idea generation activities is unpredictable and inconsistent, obstructing continuous innovation at OMD.

5.4.3 DECISION 2: FREEDOM

Empirics show that the respondents are aware of the importance of regulating the freedom. They do well in avoiding shallow research and ideas unconnected to core business. However, the emergent issue regards too rigid problem statements and challenges. To exemplify, the empirics reveal that most innovation projects starts with a problem, which receives a group of employees to manage it. Hence, the idea generation is subsequent to the assembling of the group. In turn, this often leads to many specialists attending the group, which according to theory limits the scope (Hurt, 1994). To balance the freedom and avoid too narrow innovation fields, OMD could begin with idea generations and thereafter assemble an appropriate team. Moreover, if OMD allows free innovation search there is more potential in finding radical process innovation.

5.4.4 DECISION 3: INVOLVEMENT

OMD respondents possess a positive mindset towards involvement in process innovation. Hence, OMD has employees who value innovation and are willing to participate and contribute to innovation activities. This, in addition to an open and non-judgmental environment would suggest that OMD possess excellent prerequisites to involve its workforce. However, Respondent N (2015) reflects over OMD's participation in radical process innovation and how to allocate the innovation resources. Other respondents at OMD experience discouragement in engaging in radical process innovation from corporate levels and higher management.

Moreover, it is evident that the level of involvement at OMD is low. Another reason why OMD does not involve larger parts of the organization could depend on urgent operative daily activities, leaving no time or resources for innovation. OMD should probably prioritize time and resources specifically for innovation, as it enables diversity and cross-functional

collaboration. It seems as OMD believe they incorporate diverse groups, however as mentioned in Paradox 2, the groups are often the same which limits diversity and involvement of employees. Most activities suit best for limited numbers of participants, whilst an innovation jam allows larger involvement. An annual innovation jam could in turn facilitate and motivate OMD's employees to participate in process innovation. Subsequently, OMD could obtain ideas emerging from a broader scope in a structured manner.

5.4.5 DECISION 4: APPROACH

The fourth decision identified emerged from the analysis and iterating empirics and theory. It concerns *approach* and how to practically manage the different activities. The decision surfaces the trades-offs between utilizing few or many activities. Moreover, benefits with utilizing many or all types of activities are the high number of ideas and the large spread of types of ideas that could emerge. However, too many ideas are difficult to manage and the quality of the activities faces the risk of decreasing as the number of activities increase. Moreover, it is important to manage and give sufficient attention to the activities performed, as the analysis suggests that having success factors in place ensures good quality, for both the activity itself and for innovations. Hence, if a firm decides to perform innovation triggering activities, they should be well prepared. To clarify, being an expert in all activities might require heavy work and many resources, as it is time consuming to train facilitators and participants in all tools. In addition, it might also be hard to exploit all the activities, as they could potentially result in the same ideas and innovations.

Benefits from utilizing few activities are that firms can apply good and thorough practices and customize the activity to fit the firm and the purpose. Moreover, facilitators and participants will be familiar with the activities and the firm will not have to train the employees in an extensive amount of methods and tools. In turn, the firm might be better at ensuring activities with superior quality and successful outcomes. On the contrary, applying few activities logically allows for fewer ideas. Additionally, having only one activity could result in firms missing out on good ideas and potential innovations, which another innovation activity might capture. If a group performs one activity poorly, another activity could still secure a good outcome. However, if only emphasizing one activity, all eggs end up in the same basket, resulting in a low level of diversification. Finding the right balance between having fewer proficient activities might be better than having several random. Moreover, this becomes a trade-off between quality and quantity. Therefore, it is important for firms to carefully consider what their goal for the idea generation is. In other words, if their goal is to cover large search areas and trigger ideas in various ways OMD should utilize many different activities. If for example an innovation jam is the best alternative and the firm lacks competence in how to execute it, they might benefit from adding one or several complementary activities. On the contrary, if the firm possesses proficient knowledge in one activity, utilizing only that activity could be sufficient to trigger valuable ideas.

Evidently, there is a trade-off. It is important to balance between quality and variety, and make decisions on how to approach the project or problem. The fourth paradox highlights the managerial issue of prioritizing activities and finding the right balance.

5.4.6 DECISION TREE

Through the coupling of theory and empirics, the analysis highlights a need for sufficient frameworks to facilitate the decision making process regarding which activities to use. Currently, how to go about process innovation at OMD is unclear, and lacks structure. Therefore, a tool to facilitate the navigation through the jungle of possible activities provides a framework for OMD. Moreover, the discussion of all four paradoxes results in sufficient information to provide a Decision Tree for how to approach and structure the triggering of the process (see figure 8).

The Decision Tree starts with identifying the aim for the innovation to be able to make the appropriate decision to ensure a successful outcome. Thereafter, they either decide on a formal or informal structure, based on the reasoning of the first paradox, the reliance on formal and informal structuring and process. For successful results, OMD should always balance the level of formality, meaning there should be sufficient structure to not loose opportunities and still enough informality to allow for creativity. The activities derived from choosing an informal path will still require levels of formality. The second decision, based on paradox two, is the direction of freedom in the searching for new ideas. At this point, OMD can choose how specific and narrow the research scope should be. The third decision regards the third paradox and the level of involvement of all parts in the company or not. This decision concerns who in the organization could contribute to the task, whether the task requires specific knowledge or not, and if the project has enough resources to handle extensive involvement. Thereafter the path leads to suggested activities appropriate for the previous decisions. Finally, the fourth decision concerns how many of the suggested activities OMD should involve. Hence, OMD should balance the trade-off whether to utilize one or many activities for the specific innovation task. In turn, these trade-offs concern the complexity of the task, the existing competence about the activities at the firm, and the amount of resources available.

It is important to thoroughly affiliate the decision making with the reasoning behind all four paradoxes. Subsequently, the Decision Tree and the paradoxes provide a framework and structure for how to approach the triggering of the process. By presenting this framework, OMD receives structure to an otherwise unstructured and inadequate idea generation process. In turn, this could help them target the needs, expressed as wanting to be proactive rather than reactive, and to repeatedly trigger radical ideas.

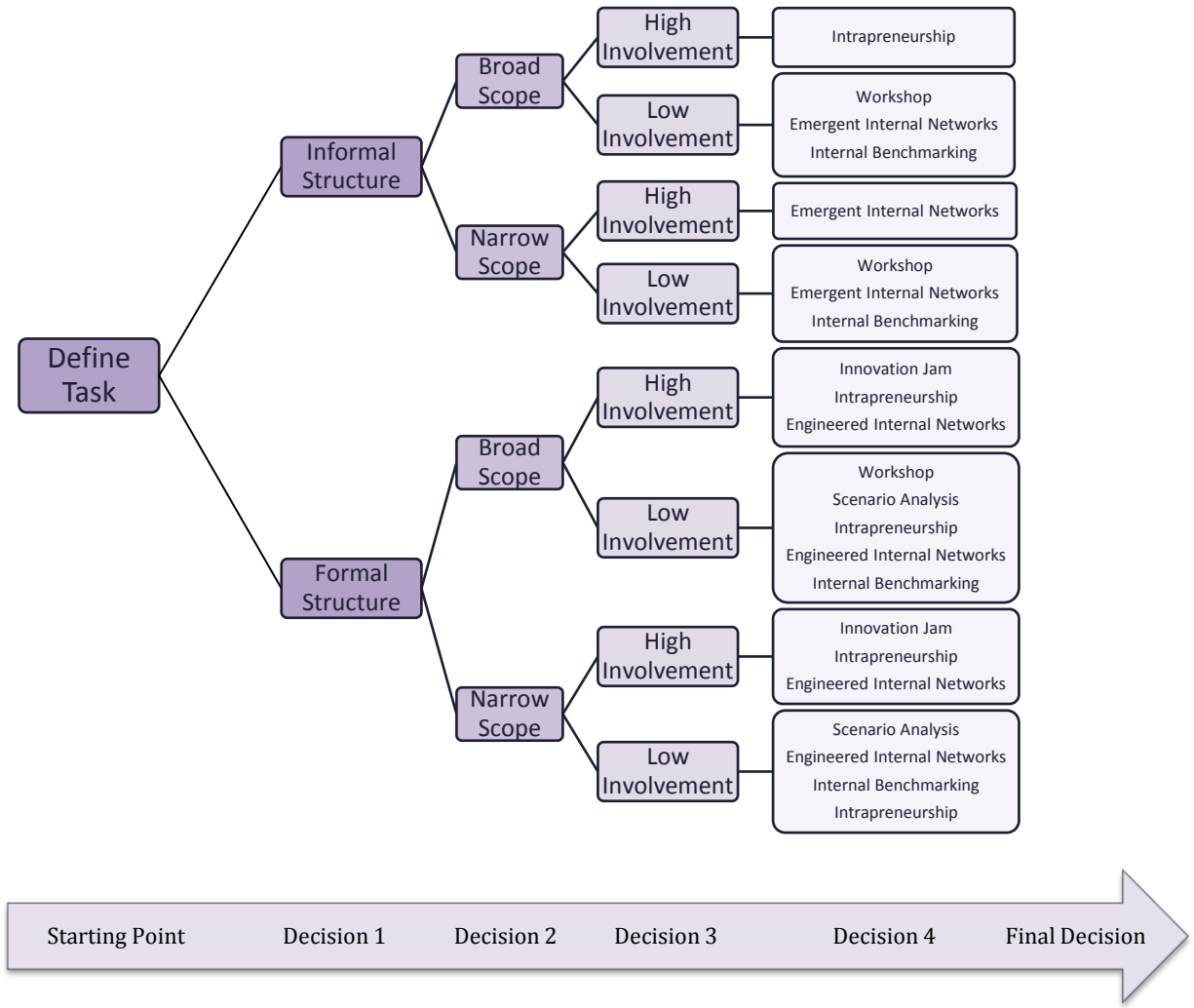

Figure 9: Authors' Decision Tree

Nevertheless, important to note is that even though it seems black-and-white in the different decisions, there are still trade-offs within the decisions, which all must balance. To specify, choosing informal structure from the beginning still shows some kind of formality. For example, an informal gathering must still have a level of formality in order to first assemble the participants and eventually capture the derived value from it. Additionally, even the most structured activities need informality to be successful, as it allows for creativity and outside-the-box-thinking even in the most formal events. Ultimately, figure 9 portrays a basic framework, which firms can utilize for deciding what activities to trigger process innovation. All in all, every situation needs its own structure throughout the Decision Tree framework. It is all about contingencies, and the decision path for one task might not be applicable for other tasks. Altogether, to be successful it is inevitable to balances the paradoxes according to the specific task (Björk et al., 2010).

6 CONCLUSION

The conclusion chapter aims to answer the research question based on the findings derived from the research. Further, the latter parts of the conclusion present the recommendations to OMD followed by suggestions for future research.

OMD clearly shows willingness and the right mindset to engage in process innovation. In addition, OMD presents an open and non-judgmental environment suitable for process innovation activities. Therefore, the most important prerequisite is in place, providing an excellent starting point for building appropriate settings for process innovation. However, the derived conclusion is that OMD does not possess a structured or functioning process to trigger radical process innovation. Firms should prioritize the triggering of the process, as the first phase is the most important in the innovation process. To answer our research question:

How should OMD trigger radical process innovation within manufacturing?

OMD should trigger radical process innovation within manufacturing by first defining the innovation task. Thereafter, depending on the task, they should continue by deciding on the level of formality of the structure, the width of the innovation scope, the level of involvement, and how many activities to utilize. OMD should use the Decision Tree framework presented by the authors in the discussion to systematically trigger radical process innovation (see figure 9). The Decision Tree supports and guides the process in how to choose the appropriate method to maximize the triggering phase through five necessary decisions. After the decisions, the chosen activities will facilitate OMD's work in triggering the process. However, solely utilizing the activities does not ensure good outcome. Therefore, to add value to the activities, it is important to understand what makes them successful and how they best contribute to idea generation. Hence, the sub-questions describe the deeper challenge:

- *What are the main activities for triggering radical process innovation?*
- *What are the success factors for triggering radical process innovation?*

There are several main activities OMD can utilize however, workshops appears to be the most common at OMD and other activities are almost non-present. In addition, OMD does not utilize the activities in a systematic manner and the results are often inconsistent. This leads to the conclusion that OMD has no main activities to support successful triggering of radical process innovation. Therefore, when deciding on new or improving old activities, the success factors become an important aspect for OMD to consider.

After analyzing theory as well as OMD's current approach towards process innovation, various success factors help pinpoint future areas of improvement for OMD. The success factors categorize according to structure, freedom, and involvement, all of which OMD should balance. Each category contains several success factors, all equally important for triggering radical process innovation (see table 11). Additionally, OMD should balance their every-day operations with innovation, in addition to prioritizing time and resources. This is not the case at OMD, as superior levels must allow the employees to work with those areas. Other important success factors concern communication, cross-functional collaboration, and

information sharing in internal networks. OMD appears to operate in silo-functions, limiting the information sharing across the division and hindering innovation and ideas to flourish.

Other more practical success factors regard assembling diverse groups, which OMD fails to accomplish, as it is also important to view the organization holistically. Additionally, it is important to have a clearly formulated task, and aiming high to ensure the right focus of the idea generation. The empirics show that OMD is good at specifying tasks and placing the bar at an appropriate level. Moreover, as mentioned above, OMD possess an open and non-judgmental environment, which is one of the reasons for why it is possible for them to pursue with finding better ways to trigger innovation. To conclude, OMD should trigger radical process innovation within manufacturing by utilizing activities derived from the Decision Tree framework. Each unique situation requires customized treatment with support from the success factors and balancing of the decisions. Therefore OMD should focus on the five decisions regarding the task, structure, freedom, involvement, and approach. If OMD does so based on the task and the wanted outcome, they could structure and plan for triggering radical process innovation in a more systematic and beneficial manner.

The thesis' contributions bridge the gap between product and process innovation, by applying product innovation theories with the case study about process innovation. In turn, this resulted in two main findings namely, the fourth decision 'approach' and the Decision Tree framework. These unique findings will facilitate OMD's work within process innovation and provide them with a tool to guide them towards better process innovation. Additionally, it highlights managerial issues or trade-offs, and creates a clear action-plan of how to proceed. To summarize, not only does the thesis decrease the gap in literature, it also provide hands-on tools for how to trigger radical process innovation.

6.1 RECOMMENDATIONS

Throughout the case study it crystallizes that OMD has an environment encouraging idea sharing and innovative initiatives. Small groups show achievements in innovation and prove the possibility to carry out non-judgmental and open discussions around process innovation. Leveraging on the environments and willingness of the employees within the small groups could serve as good examples for how OMD can achieve an organization-wide climate for innovation. To clarify, as there is success within groups at OMD, it would be a natural step to pursue with process innovation to improve the division's competitive advantage.

It is evident that OMD lacks structure and ways of working with process innovation. In turn, they overlook and miss out on innovative opportunities. A question surfacing from the case study is "how is it possible to facilitate triggering innovation within OMD, which activities do they need to consider". In order to meet the needs expressed and discovered at OMD, a Decision Tree evolved with the purpose to guide OMD towards making sound decisions about which activities to utilize. The Decision Tree connects with the paradoxes and together they will help OMD to decide which activities to choose depending on the task and aim.

Empirics show that OMD is good at specifying tasks for innovations, making a Decision Tree relevant and possible to exploit. Instead of giving OMD recommendations of which activities to use, and state whether to proceed with workshops or include other activities, OMD should follow the Decision Tree. In turn, each specific situation will receive different management tools. After scrutinizing the activities according to the fourth decision and deciding on how many to include, OMD should secure top management support. It is clear that OMD cannot proceed and develop their innovation skills without it. Additionally, top management support must be in place in order for OMD to pursue with innovation and to receive enough resources, time, money, and infrastructure. Ideas can come from all levels of the organization and therefore OMD should engage in triggering activities for radical process innovation.

As top-management support is fundamental another supporting function is necessary for process innovation to work, namely collaboration and communication. A major drawback for OMD is their lack and inability to share and document innovation within and across functions. All levels express needs for a common database for sharing and communicating around process innovation is of utmost importance. Hence, by implementing a common database, OMD could increase sharing and in turn enhance incentive for employees to innovate.

6.2 FUTURE RESEARCH

This thesis could not cover some research areas as it strictly focuses on triggering radical process innovation. An external benchmarking study could be beneficial to derive best practice activities for triggering process innovation. A possibility is to investigate if best practice within product innovation methods applies to process innovation, similar to how this thesis conducted a case study on one single case. Innovative companies such as Google, Toyota, and Apple might have inspiring ideas about how to work with process innovation.

When gathering knowledge throughout the thesis process it became clear that not only activities and their success factors must be in place for triggering radical process innovation. The soft and ‘fuzzy’ subjects related to process innovation showed to be of great significance. Organizational structure focuses on how the firm best structures and builds necessary infrastructure to support process innovation. The firm’s culture also plays an important role for process innovation, as it seems to control the mindset of employees, either allowing or hindering innovation. Creativity is also a fundamental building block for innovation and when starting to research creativity the information in infinite. In addition, leadership affects the outcome of process innovation, and different leadership styles influence and shape innovation accordingly. On top of this, incentives to innovation are a huge subject and fundamental for innovation initiatives, and it would be beneficial to explore it more explicitly.

The final major future research area is to challenge the fourth decision and the Decision Tree. It would be valuable to test if there is a significant difference in applying many activities or few to process innovation. It would be interesting to test if the fourth decision and the Decision Tree are possible to generalize across various companies and industries. As theories derive from the thesis, unexplored aspects emerge, making it interesting for future research.

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8 APPENDIX

APPENDIX A. INTERVIEW GUIDE

Setting the Scene

- How would you define Innovation?
- How would you define Process Innovation?
- What are the important steps in the innovation process?

Triggering Radical Process Innovation

- Have you been working with active idea generation?
- What would you say are the most important aspects with idea generation?
- What triggers radical process innovations?
- Who triggers radical process innovations?
- What do you believe are success factors and barriers for idea generation?

Activities and Success Factors for Idea Generation

- What would you say are the main activities for idea generation?
    - How are the activities conducted
    - Which activities do you believe are the most effective?
    - Was the task and purpose of the idea generation activity clear?
    - Who was responsible, and who participated in the activities?
    - Did it contribute to finding radical process ideas?
    - What do you believe are success factors and challenges for the activities?
- Does OMD have any internal networks for innovation?
- What does your personal internal innovation network look like?
- What do you believe are success factors and challenges within internal innovation networks?
- Does OMD encourage and allow for time allocation of idea generation?
- Do you think it is a good idea to allocate time for idea generation

Future

- What would you like to see more of within idea generation?
- What would you like to see less of within idea generation?
- Is there anything you would like to add?

Project Specific questions

- How was the idea generated and what triggered it?
- Who were involved?
- Did you participate in any idea generation activities?
- What would you say was successful in the this project
- What could have been better within the idea generation activities?