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Challenges and opportunities in the transition from product to service innovation

Idea management as a vital first step in the servitisation
journey for the manufacturing industry

Master's thesis in Management and Economics of Innovation

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SUMMARY

In today's manufacturing industry, firms adapt to survive and grow by transitioning from solely producing physical products to providing services. However, this shift presents a significant challenge that requires a robust innovation process to generate and invest in promising ideas that benefit both customers and the company. This research examines how idea management can serve as the initial stage of the innovation process and facilitate the transition towards servitisation. The authors seek to investigate the effectiveness of idea management in supporting this shift, and how the involvement of employees and customers can influence the service innovation process for manufacturing companies. The empirical findings stressed that increasing the number of ideas at the beginning of the idea management stage through engaging customers and employees and then moving through a systematic selection process are important prerequisites for service innovation. The idea management process needs to be collaborative with customers and frontline employees and have functions in place to manage knowledge exchange and ideas. Alignment between service and product development was found to be an essential success factor for service innovation. Finally, the research identified a need for manufacturing firms to establish a closer relationship with end users and not only focus on involving distributors. Managerial implications for managers of manufacturing firms highlight support and encouragement for employees on all levels to participate in innovation and to achieve a companywide initiative towards servitisation.

Keywords: servitisation, idea management, service innovation, manufacturing, digitalisation.

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1 Introduction

1.1 Background

Numerous product companies are servitising their product offerings and increasingly trying to generate revenues from services (Storey et al., 2016). When going from a focus on product development to new service development, companies may need to rethink their innovation process. Frameworks and processes for product innovation might not be suitable for service innovation because of their different requirements (Shelton, 2009). Manufacturing firms on a servitisation journey go through different stages of maturity, from providing only spare parts and repairs to being a fully integrated solutions provider. The level of servitisation calls for different levels of innovation necessary. For a company intending to be a solutions provider, service innovation is critical (Shelton, 2009). Service innovation might differ from product innovation, and managers need to have different priorities in order to maximise the return on innovation investment (Troilo et al., 2017). Compared to products, services are intangible, and customers cannot experience them prior to purchase. The characteristics of services; intangibility, inseparability, heterogeneity and perishability (Moeller, 2010), mean that information exchange and interaction between customers and the firm is required.

Ideas are the main building blocks for the innovation process; therefore, it is vital to motivate stakeholders to generate ideas and share them through a specific idea management system (Adams, 2005). The main components of the innovation process can be categorised as ideation, project selection, product development and commercialization (Jaruzelski et al., 2006). The front end of the innovation process is particularly important to manage for service innovation (Storey et al., 2016), therefore this thesis work will focus mainly on idea management, here defined as ideation and project selection, see Figure 1. More specifically idea management is concerned with the stimulation, collection and selection of ideas. It is also crucial to engage other sources of innovative ideas such as customers, users and frontline employees (Flynn et al., 2003). Ideas should be segregated, filtered, and assessed based on specific criterias. Ideas that meet these criterias are then used as input for the next stage of the innovation process (Du Preez et al., 2006). Effective idea management is needed to utilise company resources in an optimal and effective manner. If ideas are not heard and considered in a systematic way, valuable input might be lost and resources can be spilled on unvalidated ideas (Flynn et al., 2003).

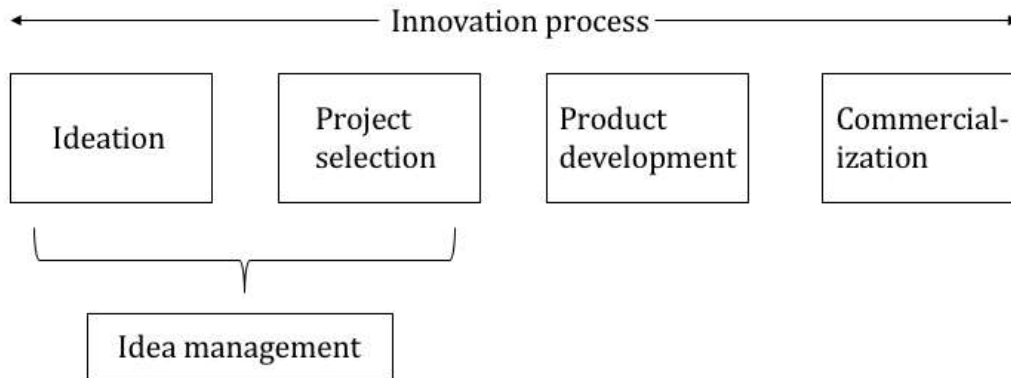


Figure 1 - The identified innovation process (Jaruzelski et al., 2006) and definition of idea management.

The research on service innovation has undergone major developments in the last decade. One of the most significant changes has been the opening of firm boundaries, applying an ecosystem or network view instead of focusing on the internal resources and capabilities for innovation (Häikiö & Koivumäki, 2016). In research comparing new service development with new product development, the benefits of involving stakeholders in the innovation process is emphasised (Ommen et al., 2016). In terms of stakeholder involvement, the literature on service innovation differentiates between three stakeholder groups: customers, employees and external stakeholders such as suppliers and academia (Ommen et al., 2016). Häikiö & Koivumäki (2016) state that it's particularly important to involve operational level employees and customers since they have an essential role in the service innovation process. Therefore, this study will mainly focus on the involvement of customers and employees. Customers can include both end users and distributors.

The case company is a manufacturing company with a long history of offering innovative products, it's a part of a larger company referred to as "the case group". The case group consists of three main divisions, but the focus of this study will be on the "construction" division, referred to as the case company. While the case company is an innovative company, it has struggled to develop digital products and services to customers. With its history and engineering capabilities, innovation of physical goods is still one of the company's greatest competencies (Interviewee 22). But the initiative to move more into offering services rather than physical products, and offering digital services in particular, is something that the company has been struggling with. It has been unable to use existing capabilities to make it into this new area. According to the case group's 2022 annual report, servitisation and connectivity is one of the trends they have chosen to focus on. A more comprehensive presentation of the case company is included in the empirical findings, in subsection 4.1.

A product director at the case company has expressed a need to develop a comprehensive innovation system since the existing R&D and product development processes for physical products and hardware might not work effectively in the current fast changing market and increasing demand for connectivity, digitalisation and servitisation. Two employees at the case company have expressed that it lacks a system for collecting ideas (Interviewee 0; interviewee 22; see 3.2). Neither from employees

and from end-users, there is no system in place that allows them to contribute with innovative ideas and suggestions. Therefore, a lot of possibilities are being ignored, as one employee describes it (Interviewee 22). Furthermore, the company is struggling with selecting and evaluating ideas in a systemized way. Some employees have stated that their input is not being considered and others experience that input for innovation is not being collected effectively (Interviewee 0). This has resulted in losing many opportunities as well as financial losses, as many investments are made into projects that are not viable.

This thesis focuses on the case company and an understanding of their current processes and practices will be used as a case study. The result will improve the knowledge about how manufacturing companies deal with challenges regarding servitisation and specifically how idea management can ease these challenges.

1.2 Purpose

This report sheds light on how idea management can be adjusted to promote innovation in general and service innovation in particular, and how this may differ from product innovation. The purpose of this paper is to increase the understanding of how idea management can be effectively conducted in the manufacturing sector in order to facilitate a servitisation transition. The success factors of idea management and service innovation guide the research in this study, and common aspects between the two areas are of particular interest. The case company was selected as an empirical case to firstly, identify the approach it has to idea management. Secondly, to point out the current practices and processes the company uses for service innovation and development. The study's results will form the basis for recommendations to be presented to the case company.

1.3 Research questions

To fulfil the purpose of this study, the research has been focused on the following research questions:

1. How can involving customers and employees influence the service innovation process for manufacturing companies?
2. How does servitisation affect the idea management stage of the innovation process in manufacturing companies?

1.4 Delimitations

- The thesis only covers the first two stages of the innovation process due to thesis project time constraints. The project will focus on idea management as this was deemed especially important but might go into further steps of the innovation process if time allows it.
- Open innovation involves a variety of stakeholders as sources of ideas, including employees, customers, suppliers, research institutes, and academia. However, as a prioritisation this study focuses primarily on analysing employees and customers as the main contributors to the innovation process. By doing so, the

research can go deeper into these two segments and gain more comprehensive insights into their role in the innovation process.

- There was a chance to extend the sample size and make use of the snowball sampling generated from our preplanned interviews. However, this study was delimited to only interview employees from the case company, and not other companies in the manufacturing industry. Customers, suppliers and other external stakeholders have not been included in the interview study even though customers are considered throughout the report.
- This study will focus on the innovation process at one division, and not the whole group. After the result proves successful at this division, the aim is for the model to be implemented across the group as well. However, implementation is out of scope of this study.

2 Theoretical framework

2.1 Service innovation

Service and manufacturing activities are becoming more intertwined (Drejer, 2004), pointing to the fact that services are not only a concern for pure service firms. Innovation is a crucial pillar in the economic performance and survival of firms (Kitsios & Kamariotou, 2021) and while innovation has typically been associated with new or improved products, the increasing dominance of services has made service innovation just as important. Service innovation is a key driver of economic performance, but it does not guarantee success and it is just as risky as product innovation (Storey et al., 2015). The services that a manufacturing firm offers are important elements of their competitive advantage, even if the services themselves don't generate a revenue (Storey et al., 2015). Service innovations have typically been reactive to availability of new methods or changes in customer demands, rather than planned strategic initiatives (Ettlie & Rosenthal, 2011). Furtmueller et al. (2009) define service innovation as *"any new services developed during innovation processes which are valuable for customers"*. Formisano et al. (2019) provide a slightly more comprehensive definition; *"Changes in service concepts or service delivery processes driven by new technologies or organisational competencies that create added value"*.

2.1.1 Servitisation

Servitisation can be defined as *"The transformational processes whereby a company shifts from a product-centric to a service-centric business model and logic"* (Kowalkowski et al., 2017). Servitisation is mainly concerned with adding value to the customer and related to the demand-pull phenomena (Frank et al., 2019). The market has been changing from pure product consumption to a more result-oriented demand and therefore customers expect additional product related services to enhance their experience. Other than product related services, there is also a growing demand for consuming the product as a service, rather than paying the cost of the product itself (Frank et al., 2019). These new expectations have resulted in servitisation strategies in manufacturing firms, entailing a transformation journey from product-centred firms to product-service systems (Kowalkowski et al., 2017). Servitisation has in itself made manufacturing companies shift their focus from product innovation to service innovation and realise that their current product development practices might be ineffective for new service development. Schroeder et al. (2022) highlight that manufacturers have to develop new capabilities beyond their product focus in order to be successful in servitisation.

Many companies have improved profit margins and enhanced their competitiveness by shifting to a service focus. Manufacturing business leaders have reported a growth in their service business and more than twice the profit margin compared to their product business (McKinsey, 2019). Because of the product focus of manufacturing firms, the benefits of providing services have often been neglected and seen as a cost rather than a revenue provider (Schroeder et al., 2022). Servitisation should not be seen as a quick fix

or marketing initiative, it's a complex transformation that often requires company wide changes. Most manufacturing companies are already providing services such as warranty services and maintenance, but servitisation aims to go beyond these base level services to offer value propositions where firms focus on providing performance outcomes to customers (Schroeder et al., 2022).

Reasons for servitisation include differentiation from competitors and opportunities related to digitalisation (Schroeder et al., 2022). Servitisation can be a part of a manufacturer's digital transformation, it is crucial for manufacturing companies to understand the interdependency between servitisation and digitalisation to effectively align the two transformations (Harrmann et al., 2023). To ensure success of the servitisation journey, the progress and outcome should be measurable in order to identify advancements in the transition and observe the quality improvements of services (Schroeder et al., 2022). In sum, servitisation requires company-wide motivation with top management support, innovation of the service offering and continuous evaluation of the servitisation developments.

2.1.2 Innovation in services vs manufacturing

Compared to products, services are intangible, inseparable and inconsistent. Therefore, practices related to product innovation may be irrelevant for service innovation (Ettlie & Rosenthal, 2011). Drejer (2004) argues that service specific research emphasise the peculiarities of services too much and therefore neglect the generality of the findings, meaning that product and service innovation are not as different as some research shows. One important aspect regarding the difference between products and services is that some service industries might be more similar to some manufacturing industries than to other service industries (Drejer, 2004). However, Storey et al. (2015) find that product and service innovation is clearly different, and managers therefore need to have different priorities in order to succeed with service innovation.

Several researchers have noted that the development process in service firms is less formalised compared to manufacturing firms (Ettlie & Rosenthal, 2011). Formalisation of the innovation process is crucial for focused and effective innovative behaviours in organisations (Ettlie & Rosenthal, 2011). However, formalising processes and activities that are not standardised is challenging. Two characteristics of services seem to explain this lack of formalisation. First, since customers are partly involved in the delivery of a service, there is a lack of standardisation. Second, a lack of planned investments into R&D for services has contributed to an informal nature of the service innovation process (Ettlie & Rosenthal, 2011). Compared to products, service innovations are usually easier to imitate, entry barriers are lower and require more customer interaction in production and delivery (Ettlie & Rosenthal, 2011). While studying the peculiarities of service versus product innovation, it is worth noting that the incentives for innovation are the same, to create new possibilities for additional value (Drejer, 2004).

2.1.3 Success factors for service innovation

Success factors of service innovation can be of interest to managers of manufacturing firms trying to servitise their products. Häikiö and Koivumäki (2016) argue that the

prerequisite for succeeding with service innovation is identifying key actors, their roles and understanding the value creation process. The service innovation process should be viewed as interactive, iterative and negotiating, and not linear and sequential (Sundström et al., 2017).

Studies on open innovation state that successful innovators leverage external stakeholders in the innovation process and suggest that this is required for growth and survival (Ettlie & Rosenthal, 2011). Co-creation, interaction, collaboration, involvement or participation in service innovation generally refers to the integration of stakeholders in the innovation process, with the belief that such an approach is associated with a positive outcome (Ommen et al., 2016). Integrating stakeholders is in line with the practice of open innovation and is meant to improve innovation capabilities (Ommen et al., 2016). In research comparing new service development with new product development, the benefits of integrating stakeholders in the innovation process is emphasised. Stakeholder involvement can enhance the outcome of a project by generating new ideas and providing knowledge to better understand market needs (Ommen et al., 2016).

Customer involvement has been widely highlighted as a success factor for service innovation (Storey et al., 2015). Intangibility of services means that extensive communication and information exchange is required between the firm and the customer. Inseparability means that services can be produced and used simultaneously which also requires interaction between the firm and the customer (Sundström et al., 2017). This also suggests that there is a great amount of information and knowledge to be managed during the service innovation process, but since services are intangible this knowledge can be tacit and difficult to manage (Storey et al., 2015). Therefore, processes and tools for collating, sharing and storing knowledge are required during development and delivery of services. The use of technology improves communication with customers, and communication with customers can be a source of ideas (Kitsios & Kamariotou, 2021). Firms need to conduct market research before developing new services and test them with customers before launch (Kitsios & Kamariotou, 2021). Companies that systematically look for new market opportunities and interact more with customers are more likely to generate innovations (Ettlie & Rosenthal, 2011; Kitsios & Kamariotou, 2021).

The importance of involvement of employees is emphasised by (Kitsios & Kamariotou, 2021), stating that employee involvement reinforces the generation of new ideas, the greater understanding of customer needs and the reduction of uncertainty. Frontline employees with customer contact are key in facilitating the service innovation process. Because of their knowledge of both customer needs as well as strategy and capabilities of the firm, frontline employees are in a good position to negotiate value in the service innovation process (Sundström et al., 2017). However, this does not happen automatically. Frontline employees need to be trained and motivated to contribute to and promote service innovations. Apart from training, employees should be motivated to contribute by some sort of incentives, either financial or not (Kitsios & Kamariotou, 2021). Managers in charge of service innovation need to be aware of how to engage both employees and customers in the innovation process (Ommen et al., 2016). For

employees, clear and meaningful goals, resources, supportive colleagues and rewards are important for motivation to contribute. In sum, the service innovation process needs to be open, driven by customer engagement and have functions in place to manage knowledge exchange with external stakeholders. Additionally, encouragement and support for employee engagement should be implemented in the development and innovation process (Gichohi, 2014).

According to Kitsios and Kamariotou (2021) resources are another critical success factor in service innovation. Both human, financial and technological resources are required to handle the uncertainty and support the service innovation process (Kitsios & Kamariotou, 2021). In Djellal and Gallouj's (2001) study of innovative service firms, they found that flexible or informal modes of organisation are far more important for innovation, they found that service innovation is very rarely done in specialised departments (like R&D or specialised innovation departments). Instead informal team work is cited as the most significant mode of organising service innovation (Djellal & Gallouj, 2001).

Opportunities for service innovation are often driven by rapid technological changes (Kitsios & Kamariotou, 2021). The development of information and communication technologies has created opportunities for introducing new digitally enabled services that create business opportunities for companies and improve people's daily lives. Inevitably, technology is an integral part of service innovation (Häikiö & Koivumäki, 2016; Peña et al., 2018). The development of information and communication technologies (digitalisation) has influenced the servitisation process and increased the efficiency and effectiveness of developing new product-service offerings. Peña et al. (2018) state that *"digitalisation and servitisation must converge; firms must embrace the digital transformation of business. If digitalisation, connectivity, and data analysis go hand-in-hand, opportunities for new services will grow"*. Therefore, digitalisation cannot be overlooked when studying service innovation and servitisation and is seen as a success factor for service innovation.

According to Parviainen et al. (2017), digitalisation refers to the process of converting analog data into digital forms that can be gathered through communication media for analysis and further use. Lenka et al. (2017) highlight the importance of data collection and analysis for manufacturing companies to increase customer value. Martín et al. (2018) emphasise the importance of data in service innovation, as it is crucial to analyse and understand different variables that are essential for developing or creating new services. Lenka et al. (2017) also highlight the significance of digital transformation and connectivity in customer's value proposition, value creation, and capturing, which can lead to additional profit generation. Digitalisation has made information more easily accessible and transparent, allowing organisations to share it with various stakeholders (Cijan et al., 2019). Enhancing information exchange is crucial for service innovation as well as idea management, digitalisation is therefore critical for both of these areas.

2.2 Idea management

Since ideas are the starting point for innovation and counted as innovation raw material, it is required to manage them to get a decent quality of ideas that can be used as input for the next stage of the innovation process. Idea management includes how to create, improve, categorise and filter ideas in alignment with company strategic objectives and priorities (Gilson & Litchfield, 2017). In this study idea management is defined as the first two stages in the innovation process; ideation and project selection. Companies may receive a huge number of ideas during the ideation stage. Effective exploitation of ideas will be beneficial for companies and their customers. Since companies have limited resources to handle ideas, the idea creation phase is less costly in comparison to the next stages of the innovation process, so it is vital to have a systematic idea management process (Flynn et al., 2003).

2.2.1 Ideation

Flynn et al. (2003) explain how leaders unlock the potential of their employees to generate creative solutions through empowering them to innovate. By combining empowerment with leadership support and commitment, individuals are given the freedom to take ownership of innovation, resulting in the creation of new and useful ideas or the combination of existing ideas into new and useful concepts to satisfy a need. Leadership plays a crucial role in fostering creativity among employees by encouraging the development of expertise, creative-thinking skills, and motivation. Flynn et al. (2003) highlight how an individual's level of creativity is dependent on the interplay of these three components: expertise, creative-thinking skills, and motivation. Novel and useful ideas can originate either in response to a particular situation or as a proactive action to exploit a new opportunity. Stevanovic et al. (2015) mentions that the study of creativity often focuses on the antecedents of idea generation, but the process of idea management encompasses multiple stages, including inspiration and involvement, generation and capturing, development and enrichment, evaluation and selection, implementation, and post-implementation learning and feedback. Stevanovic et al. (2015) have also shed light on the various models, methods, and techniques that have been developed to facilitate the selection part of the process of idea management to minimise the ambiguity and uncertainty and evaluate ideas through the benefits and risks, more details related to project selection are discussed further in section 2.2.

Leaders are responsible to motivate and empower different stakeholders to be innovative and engage in the idea sharing part of the innovation process, different innovative idea sources are customers complaints, feedback and wishes, employees, suppliers, technology and trends, benchmarking and competitors' behaviour. It is vital to maximise the number of ideas at the beginning of the innovation funnel; therefore, most enterprises work to develop efficient processes to capture innovative ideas from both external and internal sources (Flynn et al., 2003).

Du Preez and Louw (2008) listed the viability of different kinds of input during the idea generation stage, such as current problems or problem areas in the business, competitor information, client and market information, technology information, and company strategies and objectives, which can act as seeds and fertilisers to generate new ideas.

To ensure the effective communication and development of ideas, it is essential to capture them, regardless of whether they were formed spontaneously or in a group brainstorming session. This can be done by framing or documenting the idea in an acceptable format. It is equally important to maintain a record of all ideas, including those that may not be viable in the present but could be useful in the future (Du Preez & Louw, 2008).

Westerski et al. (2011) find it is highly recommended to share the submitted ideas with the public and gather feedback from other participants of the idea competition. This step allows for the incubation of data within the community for a period of time, during which it can be improved and refined based on mass opinion. The process of idea improvement heavily relies on community interaction and collaboration, as it provides a platform for sharing knowledge and expertise among participants. The feedback collected during this stage can also provide valuable insights into potential roadblocks or limitations that may need to be addressed in order to ensure the success of the idea. By engaging with the community in this way, idea creators can refine and improve their ideas, making them more viable and better suited to the needs of the target audience.

2.2.2 Project selection

Dziallas (2020) discusses how selecting suitable ideas at the front end of innovation process is a challenge for most companies, many promising ideas at the beginning of the innovation funnel do not become profitable products due to lack of knowledge combined with the uncertainty at the front end of the process which leads to further research about creating structured evaluation and selection process. The goal of the selection stage is to identify the most promising ideas and recommend them for implementation. However, there is no standard methodology for describing, assessing, evaluating, and selecting ideas. Stevanovic et al. (2015) suggests using numerical evaluation to assess ideas based on technical, market, financial, customer values of ideas and social values of ideas, each value has its weight which is calculated and accumulated based on answering a few questions related to different criterias. Researchers agree that the evaluation and selection of ideas are crucial for successful innovation. Without a clear strategy for evaluating ideas, resources can be wasted, and potential innovations may be overlooked. Therefore, it is essential to have a rational and effective model for evaluating and prioritising ideas, which can be used to make informed decisions. The outcome of this stage is the IDEA filter, which enables the selection of the most viable ideas, and the development of a concept (Stevanovic et al., 2015). In general, there is no one size fits all solution as to what ideas should be selected for further development, but the two most important considerations are company objectives and market needs.

2.2.3 Idea management in service innovation

Senior managers have an important role in ideation for service innovation and need to add weight to this assignment (Ettlie & Rosenthal, 2011). Innovative ideas are more likely to come from general managers in service than in manufacturing firms, according to Ettlie and Rosenthal (2011) ideas are just as likely to come from customers in both product and service innovation. In the early stages of the innovation process it is difficult to forecast which ideas will be successful, idea generation usually occurs before

concept development and entails great uncertainty (Ettlie & Elsenbach, 2007). Since services are intangible and therefore difficult to test with customers (Storey et al., 2015), idea management is even more critical for service innovation. Stakeholder involvement is a key factor for both service innovation and idea management and therefore of great importance to idea management in service innovation.

Employees are an important source of innovative ideas since they have enough information which enables them to understand their business situation and challenges to share their ideas about possible areas of improvement and propose new ideas. Work climate innovativeness will be increased through challenging employees and encouraging them to develop out of the box thinking to be more engaged in the innovation process (Prather & Turrel, 2002). Companies work towards adding value to their customers and end users. Users may express their complaints and wishes explicitly or implicitly, this is an important drive for companies to take the required corrective action and sense the opportunities expressed by the users input. Nowadays social media and different platforms are important places to extract innovative ideas using text mining tools or any similar analysis tools or methodologies (Kao et al., 2018).

2.4 Analytical framework

The main points on service innovation and idea management are summarised in Table 1. What is displayed in the table are success factors or critical areas of service innovation and idea management. Some common factors have been identified in these two themes; these are displayed in the third column in Table 1.

Table 1 - Summary of the theory on service innovation and idea management

Service innovation	Idea management	Common factor
External collaboration	Stakeholder involvement generates new ideas	Customer involvement
Driven by customer engagement	Share submitted ideas with the public	
Skills, knowledge and involvement of frontline staff	Motivation and expertise (training) is required to create ideas	Employee involvement and engagement
Encouragement and support for employee engagement, need to be trained and motivated		
Formalisation of process needed	Ideas need to be managed - Maintain a record of all ideas	Processes for managing and sharing knowledge and ideas
Processes and tools for collating, sharing and storing knowledge	Rational and effective model for evaluating and prioritising ideas	

Technology is an integral part of service innovation, importance of data	digitalisation has made it easier to share and manage ideas	Technology and digitalisation
Communication and information exchange required with customer	Idea sources are customers complaints, employees, suppliers, technology and trends, benchmarking and competitors, current problems or problem areas in the business, company strategies and objectives	Communication and information exchange
Process needs to be interactive and iterative		
Market research, systematically look for market opportunities		

The common success factors or critical areas of service innovation and idea management are the main focus of the study and guides the interviews and the analysis. Figure 2 provides a visual representation of the main points and the analytical framework.

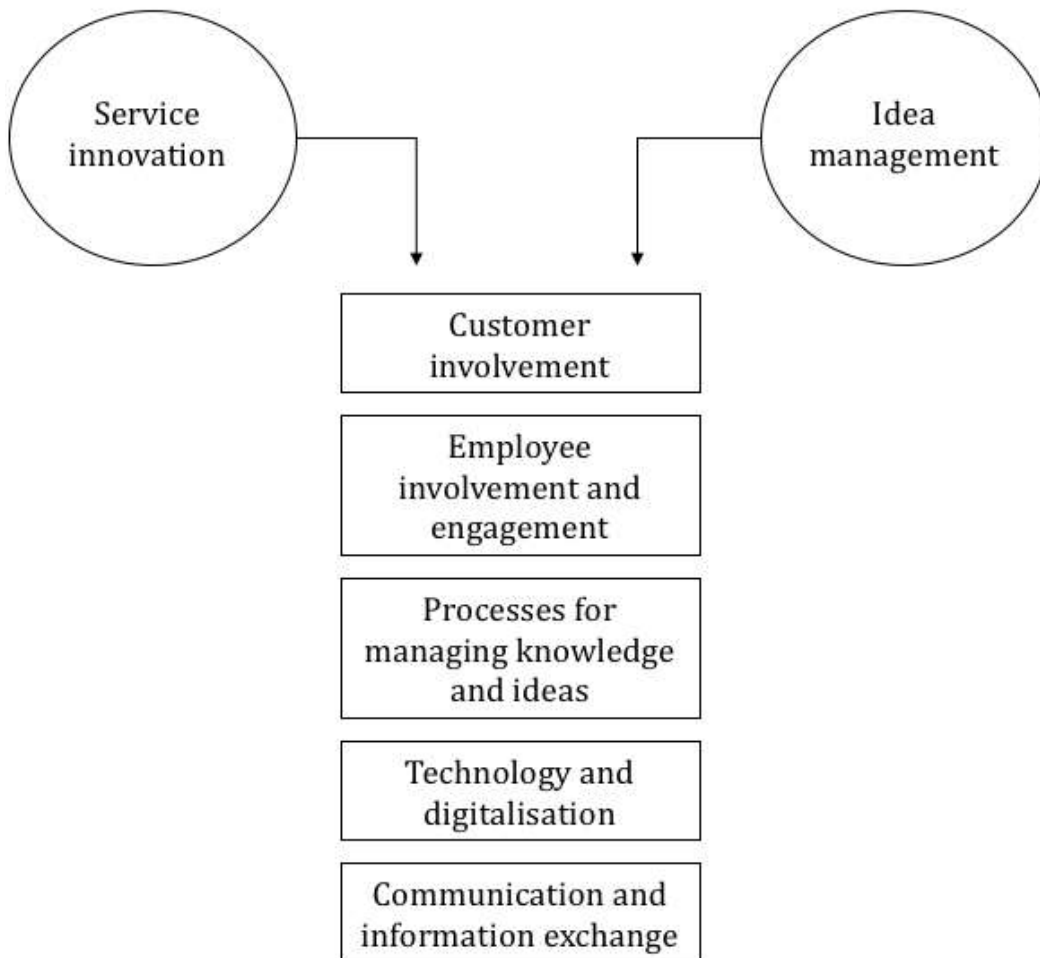


Figure 2 - Analytical framework

3 Methodology

3.1 Research approach and design

This project uses a research logic closely resembling an abductive approach, meaning that both theory and empirical findings are driving the research. The research employs a qualitative research strategy to gain insight into people's experiences in idea management and their knowledge and vision regarding the path towards servitisation. Given the absence of a standardised scale for measurement, studies and findings in this field are inherently linked to individual perceptions, behaviours, backgrounds, and experiences (Bell et al., 2019). By utilising qualitative methods, the aim was to capture the richness and depth of participants' perspectives, allowing for a comprehensive understanding of the topic. The reason for using qualitative research is supported by Hammarberg et al. (2016) *“Qualitative methods are used to answer questions about experience, meaning and perspective, most often from the standpoint of the participant. These data are usually not amenable to counting or measuring”*. To answer the research questions a case study was conducted with one company, the case study constituted the empirical findings of this report. A case study was a useful method to get concrete, in-depth information from a real-world context.

Once the scope and aim were finalised, a literature review was carried out. The literature review provided the knowledge needed for the authors to carry out the thesis project and served as the main source to the theoretical framework. The literature review focused on articles on service innovation, idea management, servitisation and digitalisation. After the literature review, a theoretical framework was written up. The theoretical framework was later used as a foundation for the interviews and for the analysis. An analytical framework was created in order to analyse the findings of the interview study in relation to the theoretical framework.

3.2 Data collection

In order to finalise the scope and aim of the project, initial discussions and open informal interviews with three employees at the case company were carried out. The purpose of this was to ensure that the thesis studies an issue or topic that exists at the company in question so that the company can serve as a suitable case study. The discussions were not fully transcribed, instead one person was taking notes during the meetings. Two of the interviewee's were interviewed again in the interview study, namely interviewee's 3 and 22. The third interviewee was not interviewed again, but is referred to in the introduction. This person is a UX Design Director at the group level of the company and is referred to as Interviewee 0 in the introduction. Earlier master thesis's done at the case company were also studied to gain knowledge about the company and what has been researched previously.

Semi-structured interviews were carried out in order to answer the research questions and serve as the empirical result, the interview guide is presented in Appendix 1. Interviewee's were selected with the help of the contact person at the case company. Respondents were mainly from the division in focus but some people from the group level and other divisions were interviewed as well. It was crucial to interview employees from different levels of the company. Employees closer to the customer could give insight into how information and ideas are shared "bottom-up" through the company and were therefore of interest to the study, for example an account manager, a sales manager and a service specialist was interviewed. Product managers, designers and R&D staff could provide an understanding of how innovation is currently carried out and what challenges they experience. Executive directors and business development managers gave insight into the strategy and market position of the company in regard to innovation and servitisation. 22 interviews were carried out in total, all interviewees are employees at the case company or case group. The full list of interviewees and their roles within the company is displayed in Table 2. The interviews were between 30 and 60 minutes, one was face-to-face, and the rest were carried out digitally. All the interviews were recorded and fully transcribed.

Table 2 - Interviewees and roles within the company

Designation	Role at the company
Interviewee 1	Sr Manager Product & Service Management
Interviewee 2	Product manager Fleet services
Interviewee 3	Director of Global Services
Interviewee 4	SVP Connectivity Centre
Interviewee 5	Test Engineer
Interviewee 6	Service specialist
Interviewee 7	Sr. Director Marketing and Training
Interviewee 8	Global Product Manager Battery Systems
Interviewee 9	Test and Verification Manager
Interviewee 10	PMO Director
Interviewee 11	President Global Professional Business Unit
Interviewee 12	Business Development Manager
Interviewee 13	SVP Concrete sawing & drilling equipment
Interviewee 14	SVP Sales & Service
Interviewee 15	Sales Manager

Designation	Role at the company
Interviewee 1	Sr Manager Product & Service Management
Interviewee 16	National Service Manager
Interviewee 17	Sr. Director Product Management
Interviewee 18	VP Product & Service Management
Interviewee 19	Strategic Account Manager
Interviewee 20	VP Sales Operations
Interviewee 21	Director, Digital Business Exploration
Interviewee 22	Product director, digital services

3.3 Data analysis

Once the interviews were transcribed, the work proceeded to analyse the findings of the interview study. The transcriptions were coded based on the main themes of the theoretical framework. Some common themes that came up during the interview, but were not included in the theory, were added as codes as well. The complete list of codes is presented in Table 3, divided by codes derived from the theory or topics that came up during the interviews.

Table 3 - Codes used for analysis of the interviews, derived from either the theory or interviews

Theoretical framework	Interview topics
Service innovation	Skills of frontline employees
Innovation process	Market research
Customer involvement	Industry specifics
Employee involvement & engagement	Service & product alignment
Sources of ideas	Reactive or proactive innovation
Ideation	<i>General recommendations for improvement</i>
Selection & evaluation of ideas	<i>Challenges</i>
digitalisation & digital services	<i>Other</i>
servitisation	
Differences between products & services	

Once the transcripts had been coded, the answers in each code could be analysed and compared. This was a systematic and comprehensive method to make sure that no data

was overlooked, and sufficient analysis could be completed. The codes *General recommendations for improvement*, *Challenges* and *Other* have not been included in the empirical findings. This was because the information was either too specific to the case company and not relevant for the study, or it was recommendations or challenges that could be linked to the other codes and have therefore been included in the relevant sections.

The analytical framework was used to capture the main themes and further analyse the connection between service innovation and idea management. The analytical framework helped guide the empirical findings and analysis in a direction to fully answer the research questions. Some codes directly correspond to the factors in the analytical framework, but data from most codes have been included in several of the factors in the analysis. Most of the codes are more specific and the factors in the analytical framework are more general across several codes. Since the data in each code can be very diverse, it was decided not to directly connect codes to factors in the analysis. The empirical findings were analysed in relation to the theory according to the analytical framework to finalise the analysis and discussion. Figure 3 shows what codes from the interviews were used for the different factors in the analysis.

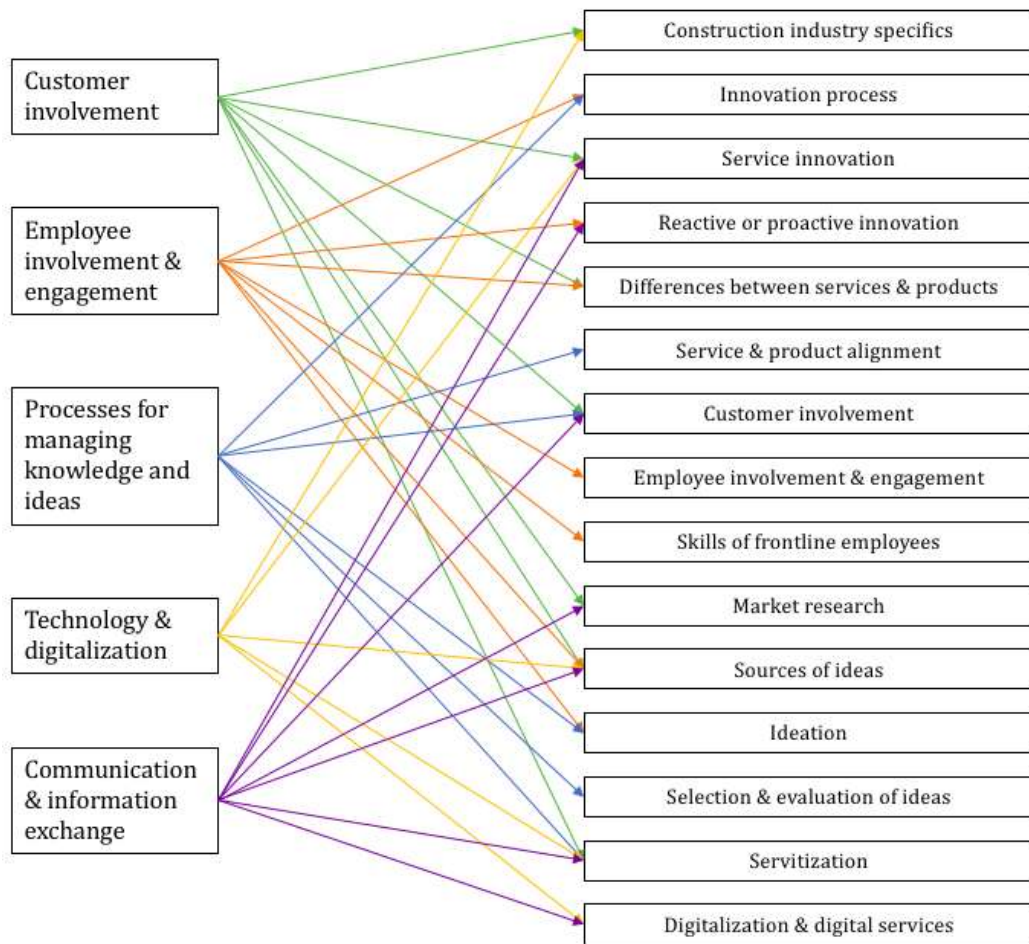


Figure 3 - Linking of factors in the analytical framework to the codes from the interviews

3.4 Research quality

Common concerns for a qualitative study involve the degree of its objectivity and transparency and further that it may not be truly replicable and easily generalised (Bell et al., 2019). In this respect, validity, reliability, and generalizability are three aspects researchers conducting qualitative studies should address (Sinkovics et al., 2008). In light of the aforementioned, Yin (2003: cited in Sinkovics et al., 2008) argues that research quality may be enhanced when reliability and validity are ensured. Following, we address the aspects of validity, reliability and generalizability to enhance the quality and trustworthiness.

Although it is advocated that there is no single measure to determine the validity of a qualitative study as opposed to quantitative studies (Yin, 2003: cited in Sinkovics et al., 2008), a processual approach consisting of five phases that may be followed in order to ensure a satisfactory degree of validity was followed for this study (Hayashi et al., 2019). Firstly, we formulated a coherent methodology chapter arguing for this paper's selected research approach, design, data collection method, and delimitations. Secondly, we explained how empirical findings were illustrated in terms of the selection and arrangement of data. Next, we elaborated on the procedure followed for the codification and analysis of the collected data. Moreover, the analysis of this paper was based on a single company consisting of several interviewed persons from different departments; hence, an in-depth understanding of the research topic was generated. Lastly, the empirical insights were compared and discussed in parallel to the theoretical framework built.

It is argued (Lee et al., 2007: cited in Bell et al., 2019) that case studies' main strength is particularization instead of generalisability. Nevertheless, others, see Flyvbjerg (2006: cited in Bell et al., 2019) argue that in-depth studies, such as single case studies, may provide a concrete basis of context-dependent knowledge; therefore, generalisation to some extent may be achievable. To this end, we have considered the number of participants in the sample size and the depth we went about each interview. The relatively large number of interview respondents and their knowledge from different companies in the industry improve the generalisability of the research. These aspects are argued to improve generalisability via rich empirical evidence as was attempted to be collected here (Bell et al., 2019).

Reliability, on the other hand, is evident when other researchers are able to obtain similar results when attempting to reproduce a study (Bell et al., 2019). Similarly to the aspects above, reliability is also argued to be difficult to ensure. In this respect, researchers are suggested to document and maintain records of the procedures followed regarding the methodology. Subsequently, records of interviews and transcriptions were maintained in order to establish the reliability of the content of the empirical evidence.

Since customer involvement was a significant part of this research, including both customers and end users of the case company could have improved the understanding and quality of this topic. Only one company was included in the interview study,

additional external respondents could have improved the result. However, an extensive interview study was conducted within the case company and most of the respondents had experience from other companies in the same industry.

3.5 Ethical considerations

This paper adhered to the ethical guidelines for research outlined by the Swedish Research Council (2002). This report fulfilled the requirement by providing information to participants by explaining the purpose of the study and the technical aspects involved in collecting data before, during, and after the interviews. We also obtained informed consent by informing participants of their right to withdraw from the study before, prior or after the completion of the study. To maintain confidentiality, all participants were de-identified to ensure that no direct link between the data and the private persons could be made. The collected data were solely used for the purpose of the study and were not shared with anyone other than the persons responsible for this report. Additionally, to comply with GDPR regulations and ensure that the collected data were not used for any other purpose, all personal data will be erased after the study's completion.

4 Empirical findings

The empirical findings start with a closer presentation of the case company, to provide greater understanding of the results. The findings from each code in the interview study is then presented, the findings have been structured in this way to ensure that the input from each code is comprehensively covered. Unless stated otherwise, the data in chapter 4 is collected from interviews.

4.1 Case company

The case company is a global market leader in machinery and diamond tools for the construction and stone industries. It has sales in more than 100 countries and production plants in 14 countries, approximately 2800 people work for the case company globally. The main sales channel is distributors and dealers with 50% of net sales, followed by direct sales to larger contractors which constitutes 30% of net sales, the remaining 20% goes through rental companies. However, the distribution between these sales channels might differ between countries and markets.

According to the case group's annual report of 2022, the construction division strives to be in the forefront with high-quality, productive products, solutions and services made for professionals. The case company is mainly present in the infrastructure, refurbishment and renovation segments with a large portion of recurring sales from diamond tools, spare parts and accessories. To be able to meet customer needs, it has developed a customer-centric global network of service centres, sales companies, dealers and distributors. The company aims to be a total solutions provider, offering a wide range of equipment as well as parts and accessories, fleet management services, service contracts, financing and training. According to the company itself it continuously develops its digital services, for example the fleet management service where customers can manage their connected fleet of machines. While the company focuses on organic growth, it has also been known to acquire companies and technologies to strengthen its product portfolio. According to the president of the case company, the company is focused on developing its offering of services and solutions in order to create sustainable value, both from a customer and financial perspective.

4.2 Construction industry specifics

This section presents interview findings from the code *Industry specifics*.

The majority of the interviewees agree that the construction industry is among the least developed industries worldwide in terms of productivity. There are several reasons for this such as fragmentation, lack of analytics and data, and lack of standardisation. The construction industry is very traditional and behind on technical developments compared to other industries. This makes it difficult to adopt or create the right ideas because the customers have to be willing to experiment and try something new, contractors are generally conservative in how they work. Several interviewees have

expressed that industries like the automobile and entertainment sectors have made significant progress in embracing servitisation, while the construction industry as a whole has been slower in adopting new technologies, especially in the mass market. However, there is a growing demand for services among early adopters in the construction industry according to interviewees. Overall, the case company's customers prioritise completing their tasks and expect reliable equipment without any breakdowns. One interviewee also mentioned that what might have been considered innovative in another industry a couple of years ago is still new to the case company. Therefore, while the company continually explores new possibilities, it also considers its own readiness and the needs of its customers.

There are also differences in construction techniques between mature and emerging markets, meaning that the demands from these markets are substantially different. Many of the interviewees express that the case company should prioritise increasing customer awareness regarding the significance and benefits of incorporating new services alongside their products. It is the responsibility of the case company to drive the transformation of its industry towards greater servitisation and digitalisation according to several interviewees. This shift aims to generate a demand for digital or product-related services. Notably, the case company's customers are accustomed to purchasing products. On the other hand, the large dealers and rental companies are more sophisticated and expect more from the case company in terms of new technology and innovation. Digital services are critical to rental customers as they run data driven businesses, but the average customers are apparently not mature enough according to several interviewees.

Interviewee 4, SVP of the case company's connectivity centre, comprehensively describes the different requirements of the case company's customers; *"We have three types of customers at constructions: we have the dealers that are selling to other contractors, we have the rental companies who are big and buy a lot and they rent it out to other companies, and then we have the contractors that are so specialised or big that they are buying tools from us directly. In the end when we are selling products, the value comes when they are using it and the end users are the contractors, regardless of who bought it. But when you look at the type of products that the rental companies want to buy, in relation to what the specialist companies want to buy, it's different. The rental companies are renting it out to general purpose people that may not be so skilled, so for them it must be easy to use and handle. But then you have a contradiction there because the rental companies are data savvy and want to be able to control the machines from a distance. For the specialist companies the most important thing is productivity"*.

4.3 Service innovation and the innovation process

This section presents findings from the interviews regarding service innovation and the innovation process, the findings from the codes *Service innovation*, *Reactive or proactive innovation* and *Innovation process* are included.

4.3.1 Innovation process

The president of the global professional business unit highlight how innovation is crucial to the success of any organisation, adding; *“before proceeding with any innovation process, it is essential to address critical questions such as the benefits of innovation to the company, the value it brings to customers, and balancing the cost”* (Interviewee 11). In this regard, the quality and value of differentiators are more critical than the quantity of new ideas and products introduced to the market. The case company’s innovation process consists of two main streams: New Product Development (NPD) projects aimed at bringing products to market and primary product development focused on exploring new technologies and concepts. While primary product development generates more ideas, not all of them make it to the market. There needs to be a valid business case before developing a new product or making any changes to an existing one as part of the NPD process. However, several interviewees agree that it’s tricky to be innovative if one needs to be connected to a business case from day one.

There is no well-defined process for innovation at the case company, except for the NPD process within R&D, additionally the acquisition of new companies with different ways of working hinders a coherent process. A more formalised innovation process, better communication as well as a clear owner of the process has been requested by several interviewees. It is critical to have process ownership by each business owner as they understand their business requirements and strategic objectives better than anyone else. There is a need to establish a structured forum that enables individuals to share their ideas, experiences, views, and knowledge, allowing the identification of contributors who can make a significant impact. Focus groups are an example of an environment that can facilitate this process, and a platform can be created to allow this flow of information to take place. Currently, there is a lack of such a platform or motorway, and this hinders progress in this area.

Interviewee 14 pointed out; *“There are numerous opportunities to structure and manage the knowledge in the company to accelerate the innovation journey, involving not only employees but also customers”*. Identifying and bringing together individuals with expertise and knowledge, who are working with customers and projects, can further drive innovation. By establishing a structured approach, this can lead to increased speed, more iterations, and ultimately, enhance innovation development. Implementing a transparent and streamlined process could greatly improve operations. Interviewee 9 highlighted the importance of considering a clear funnel structure for the innovation process, allowing easy integration of new ideas, even if they are not fully developed. Additionally, the process should be accessible to all team members, allowing everyone to track progress and stay informed about upcoming projects.

One interviewee stated that innovation requires structure, it’s repetitive ongoing work. However, Interviewee 4, points out that creating structure can limit disruptive innovation and the governance around innovation can be a disturbance in itself. Being truly innovative involves living and dreaming about visions, sharing ideas with a low threshold for associations, and iterating openly and gradually without becoming

attached to a solution. Instead an open and iterative approach that allows for the discovery of truly innovative solutions is preferred by Interviewee 4.

There are a couple of differing opinions regarding the innovation process at the case company, with Interviewee 18, a VP of Product & Service Management, stating that *“I would say in general we do follow a process, as far as when we have potential concepts, we’ll go into a pre development phase where we’ll do a proof of concept where we’ve sometimes pulled new technology out of primary development and brought it into R&D. Or we’re doing an iteration on an existing product”*. Further, Interviewee 13, a SVP of one product category, explains *“To ensure that our technology aligns with market drivers, we have a well-defined process for identifying these drivers and developing our technology accordingly. However, we lack a formal process to ensure that the ideas and feedback we receive from customers and stakeholders are adequately addressed”*. According to Interviewee 5, a test engineer, the only process the case company has is the patenting process, it starts by filling a patent report for any individual innovative idea, the report will go through a well-structured process to be assessed. If the company decides to patent the idea the employee will be rewarded for it.

4.3.2 Reactive or proactive innovation

Much of the case company’s product development is due to outside factors forcing the company to make changes to its products, for example legislation on health and safety or due to components from suppliers being adjusted. Interviewee 18 stated that it is important to add value when being forced to make changes to products; *“So that’s something I really push with my team is that when we’re in these scenarios, where we’re forced for one of these reasons I listed to make investment, that somehow along the way, we introduce some new either novelty or true innovation or improvement, so that when we bring that product to market, not only can we still have the product available, but we can introduce new customer value that we can monetize”*. Sales staff pass along information to product managers or other relevant people if something is or goes wrong, but not necessarily when something is desired from the customer. This also contributes to more reactive innovation or product development.

4.3.3 Service innovation

The case company offers both baseline services like maintenance and repair and some more advanced services like leasing of equipment, fleet management services and connectivity solutions, however most of its innovations are related to products. As Interviewee 20 described it *“From my perspective I’d say we’re very low from an innovative perspective outside of what we do with product in our actual equipment and the development there in R&D”*. The case company has been focused on consolidating and optimising portfolios due to a lot of acquisitions but may not have put enough emphasis on radical innovation as mentioned by Interviewee 12 and several others. However, the company is making significant changes in its portfolios, such as batteryfication, connectivity, and sustainability.

Customer concerns can be considered a valuable source of service development ideas. Interviewee 6, a service specialist, concluded that *“Service development should be*

cooperative work with the customer, which is not the case for our company, we are a product focused company". Customers are interested in products that create profit for them and usually don't see services as an opportunity for this, according to Interviewee 16. Services are generally viewed as problem fixers rather than money makers, both internally and externally. However, Interviewee 12 pointed out that the case company works to make their end customers more profitable and productive with the help of connected services and solutions. Services may not generate direct revenue, but they can provide better understanding of customer needs and enable the company to design products and services that best serve customers. Opportunities for innovation exist in analysing data collected from customers, such as improving control, productivity, and usage of products.

Interviewee 4 suggests that "lean start-up" is an appropriate approach for service development, which involves starting small, iterating, and evaluating. The company has many ideas for services, and innovation days allow developers to explore ideas, which are then presented to the product management team to decide which to proceed with. The main challenge for the case company is taking service ideas to the market. Management support is needed for budget and time allocation to test service concepts and ideas. However, Interviewee 20, a VP of sales operations, emphasised that the company should focus on innovation in processes and logistics, rather than in new services.

4.4 Servitisation, digitalisation and digital services

This section presents findings from the interviews regarding servitisation, digitalisation and digital services, the findings from the codes *Servitisation* and *Digitalisation & digital services* are included.

4.4.1 Servitisation

Servitisation and increasing the service offering could help mitigate some problems, for example seasonality and instead having a more recurring and stable revenue according to Interviewee 21. Several interviewees explain that the case company has been slow in service innovation and servitisation partly because it is a company with a strong mechanical background, it is on top of making good products but hasn't come that far when it comes to services and solutions. Servitisation and digitalisation is considered to be two of the weakest areas where the case company hasn't really seen the benefits. A lot of the services that the case company has developed are still more or less given away from sales out to the customers, so it is yet to see the financial benefit of it. The service offering at the case company is mainly driven to make it easier for the customer, but the willingness to pay needs to be there. Employees at the case company have seen an increasing demand for services, but many customers think that value adding services should be offered for free as a way for the firm to be more attractive, so the willingness to pay isn't always there. However, several interviewees explain that some of the case company's customers are using a third-party solution to have inventory tracking etcetera, so they are interested in paying extra to get those types of functionalities but

are forced to look outside of the case company since its solutions or infrastructure has not been good enough.

The services that the case company is currently offering have not yet been very profitable, which hinders the company from investing more in services. For example, the company's "Fleet service", is said to be a good service and provide a lot of customer value, but it doesn't bring in a lot of revenue. Fleet service is a digital service for professional, commercial customers, it's an asset management system for companies to keep track of their equipment, where it is located, and what the status is. Interviewee 2 explains that *"One of the key benefits of using the Fleet service is that a lot of data can be collected and then provided to the customer, so the customer can make business decisions and improve their business and be more productive and efficient based on that"*.

The case company is an old company with a lot of processes, and everything has been focused on building products. The organisation revolves around starting a project, developing a product, releasing a product, selling the product. The development and delivery of services requires continuous and iterative work, which can be a challenging transition for the case company. Since the company has a two-year warranty on its products, customers can be hesitant to buy products as a service because the benefit is unclear. The direct customers, larger contractors, would be the area of opportunity in terms of servitisation, it could be difficult to sell the product as a service to dealers who aren't the end users. One of the case company's main competitors, went from selling tools to selling tool fleet management services and have been very successful. Interestingly though, the case company's competitor exclusively sells directly to its customers and unlike the case company doesn't go through dealers or rental companies.

Several interviewees see the transition towards servitisation as strategically important, and the case company needs to be leading and seen as innovators in the area. Interviewee 15, a sales manager, has observed a shift to a more service centric business, describing that in the past his team used to be 100% product oriented but today it is completely different, and the team is working with global services for the customers.

Services can be difficult to make business cases for since the main value might be indirect, interviewee 4 points out that *"Then you are occupied by the value it brings the company or how much extra revenue you can get from it. But it may be that the result of it is that you will understand the customer, which means that you can in a much better way serve them, and by serving them in a better way you will earn more money"*.

4.4.2 Digitalisation and digital services

The case company is working with developing connectivity and integration of connectivity into the products during the NPD process, but the company is still pretty immature in what that means both as far as integrations, the technology itself, and how the data is used. The industry isn't used to paying for digital services, it's used to paying for equipment so that is a challenge in itself according to several interviewees. Interviewee 4 highlights that digitalisation has created a greater need for vertical integration, further stating that *"it's no longer optimal to organise around products and*

rely on that each individual division or product unit can operate individually, it needs to be aligned because the process and how things are used are so much more important today”.

The case company has tried offering attachments that give data back to the customer on utilisation, uptime and runtime but that hasn't really taken off. The company is developing tracking of the equipment, which will be especially useful for more expensive products. But Interviewee 20, VP of Sales Operations, thinks it could be difficult to sell information on how the product itself is performing through dealer channels and for the dealers to see any value in selling that service on the case company's behalf. However, Interviewee 18, VP Product & Service Management, stated that customers have a desire for more in-depth insights into their fleet of equipment, how it's performing on jobs, proactive service notification, where the products are, all of those functions that connectivity of construction equipment could offer.

Digitalisation provides information that can help make data driven decisions, and the data can be used in many ways. The case company aims to use the data it gets from digitalisation in its service offers to customers. Taking data from the machines to help customers be better at using the equipment, be safer and more productive can make customers value that equipment more, Interviewee 22 pointed out. The case company would benefit from using digitalisation to understand how its products are used in the field, since it is generally struggling with this today, according to several interviewees. Another challenge with providing digital services is that companies with a big fleet of products that might demand these services are not only buying the case company's products, but they want to have one single system which is very difficult to manage with other companies, this pushes the customers to get a third-party solution instead.

4.5 Products and services

This section presents findings from the interviews regarding the relation between products and services, the findings from the codes *Differences between products & services* and *Service & product alignment* are included.

4.5.1 Differences between products & services

Service development differs from the development of a new product, as it requires active participation from the customer. In a service benchmark study conducted by a Munich-based company, it was found that service products can only be developed in collaboration with the customer, Interviewee 6, a service specialist, highlighted. At the case company, one of the biggest challenges is shifting the company's focus from being product-focused to being customer-focused, as the development of services is driven by customer needs. Although selling new products may be easier than selling services, services offer opportunities to add value to existing products and better meet customer demands.

One of the main differences between product and service lies in the required skills of the staff according to several interviewees. Interviewee 9 stated that *“At present, [the case company] has many mechanically skilled personnel who possess extensive knowledge of*

mechanical design and related areas. However, as [the case company] ventures into a new realm, it requires a greater number of individuals with expertise in service-related areas such as software and mechatronics”.

Physical products offer a tangible experience, allowing users to feel, see and work with the product. New product iterations strive to offer improvements over their predecessors, such as decreased vibration or increased power. In contrast, services lack the tangibility of physical products, and customers' perceived value of the service can be very different. Product innovation is straightforward compared to service innovation, capturing the requirements for new services is often a continuous process that involves learning, testing, and modifying until a solution is developed. In contrast to the traditional approach of building physical products, the development of services and digital offerings requires a more agile and nimble approach. For example, Interviewee 9, a test and verification manager, concluded that *“The significant advances in innovation will likely be in the realm of connected machinery, machine-to-machine interactions, streamlining features, and autonomous capabilities. However, the innovation process is not a simple, linear one, and there may be some trial and error involved”.*

4.5.2 Service and product alignment

An interesting finding during the interviews was that for a manufacturing company trying to servitise its offering, alignment between products and services is essential. Several interviewees highlighted that all services, product-related or not, have to be developed in close collaboration with product development. The case company's products and services are currently not very aligned, the services are developed in one part of the company and products are developed in another part. There's not a very close coordination of products and services since they are in different categories, which hinders the acceptance and integration of new services. The case company does conduct several tests to ensure proper integration of products and services, but often these tests occur late in the NPD process. Final testing of digital services occurs just before product release, which is not ideal. Therefore, the company is working on changing this process to conduct testing earlier in the NPD process. It has happened more than once that a product is ready for launch, but the related service never comes or is ready much later than the product.

To summarise, Interviewee 4, stated that *“We need to have an alignment so that the people working with the traditional way of developing products can understand what we [working with digital services] do. And then I think that finding the intersection between the agile way of working and the traditional product way of working, there you have a friction point that you need to manage. And the way you're managing friction is not by being innovative, it's being structured so that people know what they can expect. So my customers are really internal. It's how I can make it easier for the R&D units to create connectivity so that we can explore and create the solutions based on the data we are collecting”.*

4.6 Stakeholder involvement

This section presents findings from the interviews regarding stakeholder involvement, the findings from the codes *Customer involvement*, *Employee involvement & engagement*, *Skills of frontline employees* and *Market research* are included.

4.6.1 Customer involvement

Interviewee 7 highlighted that the end user is the number one person to listen to, it is the one driving the business and the person that needs to be satisfied, not the middleman holding the product in store, but communication needs to happen with both of these stakeholders. For the case company, the fact that the majority of sales go through dealer channels means that the needs of the end user are not being fully understood and captured at the moment. The warranty registration process could be improved to capture customer information beyond the sale and warranty period. Dealers currently act as the intermediary for filing warranty claims, which limits direct customer interactions. An incentivised system for dealers to submit sales records at the point of sale can help to capture valuable customer data.

Customer involvement is not only important to collect input, but also to educate customers in areas where the company is launching innovative products or services, then customers need education in how to use it to understand why it's worthwhile, Interviewee 12 pointed out. Several interviewees highlighted that it's important to observe the end user as an input for innovation since there can be a discrepancy between what customers say and do. It can be difficult to get customers to fill out forms to give feedback and input, instead the product managers and sales team needs to work closely with the dealers and visit job sites and end users.

The sales teams are in daily contact with the customers, and customer input is usually bubbling up through the organisation from the sales teams. Input and feedback from customers flow up in the organisation through an informal process, it's usually word of mouth and extremely ad hoc, several interviewees agreed. There are plenty of functions in place to communicate customer input throughout the company, it's just a matter of using them. Since product development rarely interacts directly with customers, it's important that they can get the voice of the customer indirectly from the organisation.

An idea shouldn't be refined too far before touching base with the customer, it's crucial to involve customers already in the early phases of development. At the moment the case company involves the customer a bit too late, which means a lot of feedback comes in but there is no time left to act on it according to Interviewee 9. Interviewee 20 gives an example of a battery product that was launched, the sales team had demos after launch and realised that the product didn't have the capacity to perform in the functions most of the customers needed it for. To summarise *"So that's the kind of thing where as we're doing that, we're collecting that voice of customer, which really should have been done long before that product was ever launched, in a more thorough way"* (Interviewee 20).

The interviewees agree that customer involvement is extremely important, especially for developing services, but believe it is an area of improvement for the case company. Interviewee 13, SVP of one product category, explained *“To really be innovative and ahead of competition, you need to have knowledge about the hassles that contractors have on worksites. For example, if the function of a product is to drill a hole, the people using that product would tell you they spend 95% of the time transporting the equipment, finding the manager telling them exactly where to drill the hole, finding the electricity, finding the water hoses and taking the equipment back again, and only 5% of the time actually drilling the hole”*. Interviewee 13 further stated that *“To find what really helps the customer, you need to understand what his or her working days are like, and I think that R&D at [the case company], and in many other places, concentrate so much on the little things that maybe it doesn't really matter if the drilling is done in one minute slower, it really doesn't matter for the guy as long as the total job gets done”*.

Interviewee 12 provided some insight into customer involvement; *“Something I would like to push is of course how involved are our customers and how often are they actually coming in with our innovations. We tend to be quite internal instead of asking our customers and involving them in our development processes. So that is something that I would like to see, who and how do we actually involve the customers to get their feedback straight into the project so that we get that input as early as possible, don't make any large investments in areas that might not be successful in the future and also make sure that we already have a customer demand when we launch the products”*.

4.6.2 Employee involvement and engagement and Skills of frontline employees

Several interviewees agree that sales team members and customer service staff have the best knowledge on where the problems are and know the customers best. However, frontline employees might not be listened to even if they have very valuable feedback, since they are not respected in the same way within the company. Involving more cross-functional teams in the innovation process could bring fresh perspectives and diverse expertise according to Interviewee 10. The case company tends to have the same people looking for solutions to similar products, but it could be beneficial to involve different parts of the company, not just engineering teams according to Interviewee 1. The company currently lacks a systematic approach for this collaboration.

Frontline employees need to be trained to sell services and not just products, as the company shifts to a more service centric offering, several interviewees agreed. The typical sales person intends to sell ready products and doesn't have the knowledge on how to sell service contracts. How sales are done today compared to 15-20 years ago is also very different, the digitalisation of selling in terms of social media and how to reach, discover and maintain customers. The case company is trying to promote and train its frontline employees to handle this evolution. To facilitate service innovation, sales staff need to be trained to be censors for possible service projects, since the main connection to customers is through sales teams according to Interviewee 6. However, sales staff are not incentivised or motivated to engage in innovation or improvements. The case

company might have to change some of the customer-facing roles to interact in a different way with customers and the rest of the organisation.

It is critical to involve employees in the development and decision-making process of new services according to several interviewees, sales staff need to be involved so they know how to sell the service, and other employees need to be able to provide input, highlighted by Interviewee 16. There are examples from the case company of times when services have failed partly because employees haven't been involved before launch. Interviewee 16, a Service Manager, gave an example of the service contract that the company offers, originally when it came out the sales team was given very little training on how to sell it and employees outside of Sweden weren't involved in the development of the service, so it failed. The second time around they got to be involved, the service is now simpler, and the salesforce understands it. Further, employees at the case company describe that they would like to be engaged and get to know where their suggestions and recommendations go, suggesting that this communication is not very open.

It is important not to prescribe and order employees too much since this limit's innovation according to Interviewee 11, at the case company the product managers are left to innovate in their own space, there's no interference from up to down. However, there is an issue with loading people in R&D with too many daily tasks and deliveries, so they never get a chance to spend time working on new ideas. To deal with this, within the R&D community at the case company there are "innovation jams" where people are given time to come up with some ideas and small pet projects where they are allowed to spend time and to work with these ideas, usually in teams that are not usually working together.

The company also utilises "innovation reports" which essentially refers to the patent process. Initially if someone has an idea there is a structured way to fill it into a template and a nomination committee looks at it and, in the end, a patent might be granted. The employee who came up with the idea is then financially compensated. It should be noted that it's almost exclusively employees from R&D that file innovation reports. Interviewee 5, who is a test engineer, talks about his experience on this topic; *"We even had goals for us to provide such ideas. For example, last year, there was a personal goal to do, I think at least one idea that would be investigated for a patent. And there's a process which is pretty straightforward"*. The case company is good at giving credit to employee's that are filing patents, the company recognizes employees not only for patents but also for submitting innovative ideas. But interviewee 4 pointed out that it's generally very connected to patent generation.

Generally, it seems to be individual initiatives that drive employee involvement in innovation rather than company wide strategies. For example, Interviewee 2, who manages the fleet services team, allows his team to provide and work on ideas; *"All the developers in our team can provide ideas. They get together on those ideas to form a small team and dedicate one day every month where they can spend the entire work day just focusing on this innovation or idea they have come up with. We have a selection process*

before so not all ideas will actually be allowed to work on". However, this way of working is not present throughout the company.

4.6.3 Market research

Market research is an important part of innovation and a critical step towards understanding customers. Analysing the market and other competitors is also necessary to stay competitive and understand market trends. The case company is continuously monitoring the competitor situation and the market as a source of innovation. The company also participates in shows and exhibits, it's believed to be the best time to get in front of the customers and understand what's going on with competition in the market and what their changing needs are.

It's usually the marketing team that is involved in measuring the market, what customers are buying and what they want to see, through customer surveys for example. Otherwise at the case company the market and user requirements are something that the product manager should define and that should be an input at the start of a project to define the scope and outcome, several interviewees explained. Moreover, a competitor analysis is also done in the beginning of each project.

4.7 Idea management

This section presents findings from the interviews regarding idea management, the findings from the codes *Sources of ideas*, *Ideation and Selection & evaluation of ideas* are included.

4.7.1 Sources of ideas

Ideas for improvements and innovations arise both internally and externally. Other industries, competitors and trends seem to be an inspiration and guide the generation of new ideas. At the case company most ideas come organically from the different R&D departments, both the chief product engineers but also the primary team. From an R&D point of view, a test engineer stated that *"We are the people that use the product the most within [the case company] and have the best idea on how to use it and how it's being used. So therefore, it's sometimes easier to suggest ideas or improvement"* (Interviewee 5). The actual innovation or technical solutions are usually made internally but it's almost always driven by a need the company has seen in the market or gotten directly from customers according to some interviewees.

It's stated that the best input comes from customers and new ideas should come from market research. Ideas sometimes come from customers but it's very seldom, again this is seen as an area of improvement that product development should have closer contact with the customer and be out in the market. However, large contractors and large rental companies are said to be contributing with new ideas. A few of the interviewees describe that customers are not the source of ideas, but their input is important in order to validate ideas. Several interviewees also describe that most of the case company's innovations are more of a technology push rather than market pull, at least when it

comes to more radical innovations. Interviewee 8 however stated *“I think it’s more market driven when it’s a product. Services are so new for us, so we don’t really know how to ask the question to the market and the market may not see the value”*.

Another source of innovation could be acquisitions, the case company has a long history of acquiring technology and businesses, sometimes it’s not regarded as being innovative, but it can also be seen as a different business model.

4.7.2 Ideation

There is a lot of knowledge and good ideas at the case company, but the company has a hard time capitalising on some ideas and actually taking them from an idea to commercialization. One reason for this is that it usually takes too long to get approval to make a prototype or test an idea. Anyone at the case company can submit an innovation report, but there is no company-wide system to register or collect ideas since it needs to be conceptualised and have a bit more substance to qualify for an innovation report. There are groups within the case company that are good at coming up with new ideas, but it’s usually related to improvements or ways of working, not things that are totally new.

Something that is missing, as far as a system is a process for catching ideas from the internal organisation, information is usually gathered when there is an issue, but the company doesn’t capture organic ideation form across the organisation. Having a platform to collect ideas and processes of communication could add value and improve innovation capabilities. Interviewees requested a structure to collect ideas in an organised way, but also a process to select the most valuable ideas to move forward with. A comprehensive feedback system on what happens with submitted ideas would also be valuable for the employees.

Organising ideas effectively is a challenge for the case company as it currently lacks a centralised system. The company captures and documents ideas through customer journeys and user insights, but this only represents a portion of the information collected. The case company is a tight knit division where anyone can share information, but that doesn’t necessarily mean that the information is being gathered properly. While information can be shared, it is vital to make sure somebody is there to hear it or retain it. At the case company there is a public process for external inventors to submit ideas, but there’s not an internal system like this outside of R&D. The Fleet services team uses a team workspace tool to register and collect ideas for everyone in the team to see, perhaps this could be expanded across the whole division.

The project management office (PMO) is ensuring that the case company is working cross functionally in the projects, usually it has only been primary development or R&D that have been working on ideas, so the PMO is trying to bring in more views into the innovation funnel. However, there currently seems to be a lack of interaction between departments. It’s also highlighted that if the customer was connected to a larger extent there would be a lot of free knowledge for ideation as well.

The manager of the Fleet services team is actively working to make his team generate more ideas; *“We have tried various approaches to be more innovative in our team that is working with our service. We have had dedicated days that we called Innovation day or shotgun day where the developers could spend two days working on whatever they wanted, then by the end of those two days they present it to the product management team and we decided which one was the winner, which one should we take forward and actually include in our service”*. Further explaining that *“we have also discussed if we shouldn’t stop ideas and just let the developers work on whatever they want. Because there is sometimes a value in actually allowing co-workers to do what they want to do, if they are inspired and they see that this is something that could be important. But right now at least we have said that let’s try and filter out some of the ideas so that we don’t work on everything”* (Interviewee 2).

4.7.3 Selection and evaluation of ideas

The case company has an Innovation Forum that provides a platform for ideas to be brought forward and discussed, decisions are made on whether to proceed with further activities or pre-work to determine if an idea is worth pursuing. While there may not be complete control over the ideation process, the Innovation Forum serves as an avenue to ensure that promising ideas are considered and evaluated. All ideas or proposals have to be approved before they go to a pre-development phase, certainly not every proposed project gets approved. There’s a lot of prioritisation that happens on where the case company will have the most impact, either with brand new innovation that it brings to the market, new ways of working, or where it has a competitive opportunity to take market share. To get approval for investment in a new product or service there needs to be a validated concept with the sales organisation. New developments have to be carefully chosen to spend the time and resources necessary, but there doesn’t seem to be any explicit process for how this is done at the case company. Interestingly, Interviewee 1, believes that it would be especially important to have an idea management system for services, because for products the company is more mature and can handle it better as it is.

Selection of ideas is based on global trends and product roadmaps, but some decisions are affected by legislation that requires changes to products or ways of working. The product managers in collaboration with PMO and R&D are the ones who are setting the roadmaps and thereby should decide if the ideas that are available are interesting or not. For each product group there is a business plan and usually also a long-term strategic plan, the ideas need to support the strategic direction and the business plan and thereby influence selection.

The case company is very good at doing some innovative things, but quite often they might not be meaningful to the company or the customers, according to several interviewees. If the company constantly puts products on the market that don’t take off, it’s a failure for the whole innovation process, so selection and evaluation of new ideas is critical. It’s also important to measure how many ideas from primary development go into new product development. Several interviewees highlight that the case company could be more selective with ideas and “kill” them in an earlier stage. Right now there is

a long start-up phase which makes it more difficult to stop projects when it is evident they won't be successful. A quicker process and shorter time to generate ideas and test them is requested, but with a tougher filter to progress.

5 Analysis & Discussion

The analysis and discussion compare the empirical results with the main ideas found in the theory and highlights similarities, differences, and new areas that were not touched upon in the studied theory. The analysis is structured according to the analytical framework; the success factors or common factors for service innovation and idea management are the main pillars of the analysis; see Table 1 for detailed information about the different factors.

5.1 Customer involvement

The majority of opinions gathered from the case company emphasised the importance of involving customers and users in the service development process, which is in line with the theory, see e.g. Storey et al. (2016) and Drejer (2004). Several interviewees stressed the need for joint work between not only the company and customers, but also between the company and its end users. Involving customers in service development activities as recommended by Häikiö and Koivumäki (2016) is in harmony with the case company's intention of getting customers feedback in the early development stage to make sure that investments are justified to create successful services and respond to customer demands.

Several interviewees mentioned that many of the case company's customers think that value adding services should be offered free of charge, however some customers are willing to pay for the services that significantly add value to them. Some customers are currently paying for third parties to develop services that are not developed and offered by the case company such as inventory tracking systems. Customers' readiness to pay for services was discussed by Kitsios and Kamariotou (2021), they stated that *"customers are willing to pay to purchase this service because it adds value to them, and they will possibly repeat their purchase"*.

Customers' concerns are considered valuable input for service development; therefore the case company proposed an incentive system to its dealers to encourage them to share customers' data and information. Interviewees from the case company have observed a growing customer demand for their services, aligning with the findings of Ettlé and Rosenthal (2011) who stated that service innovation often emerges as a response to evolving customer needs, rather than being driven solely by strategic initiatives. This perspective is further supported by Frank et al. (2019), who also discussed the phenomenon of demand-pull as a key factor in driving service innovation.

Engaging customers in service innovation is the responsibility of in-charge managers as highlighted by Ommen et al. (2016), the case company realised the difficulty to involve customers and collect data from them through feedback forms or questionnaires only and assured the responsibility of product managers and sales teams to work closely with customers and users at job sites to understand the work nature, operation environments, and user's needs.

The awareness of customer involvement during service development is high at all levels and across different business units at the case company. However, the interview study shows a divergence among employees regarding their perception of how effectively the customer's voice is heard and considered. Some employees find it difficult to incorporate customer input during service and product development and don't think this is being done sufficiently enough. It's stated by several interviewees that customer feedback is predominantly conveyed through word of mouth and verbal communication. On the other hand, certain interviewees have noted that there are ample communication channels available within the company to gather customer input; the key lies in utilising them effectively. There is a noticeable discrepancy in how different departments handle customer interactions and feedback. Nevertheless, all participants emphasised the importance of implementing a more organised and transparent process to obtain and analyse customer feedback at all stages of service development and validation. This aligns with the insights shared by Drejer (2004) regarding the significance of the customer as a co-creator during service innovation.

In summary, active involvement of customers during the transition to servitisation or the addition of new product-related services in manufacturing companies is crucial for driving innovation in the right direction. Involving customers early ensures that the developed services align with customer needs and add value to existing products, thereby generating profitability for the organisation. Furthermore, involving customers in the process strengthens the manufacturer-customer relationship and provides a foundation for joint development and the creation of new services.

5.2 Employee involvement and engagement

In terms of servitisation, employees on all levels need to be involved to drive this transition. As a manufacturing company ventures into selling services, interviews highlight that the required skills of the staff will be different, and training of staff is critical to facilitate a company-wide transition. The empirical findings support the theory that involving more cross-functional teams in the innovation process could bring fresh perspectives and diverse expertise, however, the case company currently lacks a systematic approach for this collaboration. Employee knowledge and skills have been pointed out as important aspects for service innovation in numerous studies (e.g. Drejer, 2004; Storey et al., 2015), it is therefore crucial both to train employees and involve them in the development of new services. The empirical findings agree that identifying and bringing together individuals with expertise and knowledge, who are working with customers and projects, can further drive innovation. Interviewees also highlighted that employees want to be involved in the decision making of new service or product development and provided examples of when new services failed because operational level employees were not involved.

Employees need to be motivated and given support to contribute to the service innovation process by some sort of incentives, either financial or not (Kitsios & Kamariotou, 2021). Another aspect that emerged from the interview study was that it's important for employees to know where their ideas and suggestions go. If there is no follow-up communication, employees are less likely to want to contribute. A

comprehensive feedback system on what happens with submitted ideas would be valuable for the employees. Clear and meaningful goals, resources, supportive colleagues and rewards are important drivers of employee engagement. To enhance ideation it is equally important to provide support and freedom to innovate and create (Flynn et al., 2003). The empirical findings agree that it is important not to prescribe and order employees too much since this limits innovation, at the case company the product managers are left to innovate in their own space. The interviews show that R&D staff are rewarded and motivated to come up with new ideas and are naturally involved in the innovation process. However, sales staff are not incentivised or motivated to engage in innovation or improvements. Regarding rewards and recognition, the case company has a system for financially compensating employees that contribute with ideas. However, this process is generally limited to patentable ideas and is mainly used by employees in R&D. This limits both what sort of ideas and improvements that qualify and what employees that are invited to innovate.

The involvement of frontline employees in particular has been highlighted as a success factor for service innovation because of their knowledge of both customers' needs as well as strategy and capabilities of the firm (Häikiö & Koivumäki, 2016; Sundström et al., 2017). The empirical findings contribute to this theory, besides involvement, frontline employees also need to be trained to sell services and not just products, when a company shifts to a more service centric offering. The typical sales person at a manufacturing firm intends to sell ready products and might not have the knowledge on how to sell services. At the case company, involvement of frontline employees is limited and information from sales staff usually only comes up when something is wrong. Frontline employees might not be listened to even if they have very valuable feedback, since they are not always respected in the same way within the company. Besides providing knowledge and understanding of the market, employee involvement can also help generate ideas (Ommen et al., 2016; Kitsios & Kamariotou, 2021), and is therefore also crucial for idea management. To facilitate this process, the empirical findings suggest that there needs to be a forum that enables employees to share ideas and knowledge. The interviews also shed light on the fact that the innovation process has to be accessible to all employees, allowing everyone to track progress and stay informed about upcoming projects. Most ideas at the case company come from the different R&D departments, although this is natural and not necessarily negative, there might be a great deal of valuable input from frontline employees that is being neglected. The lack of employee involvement is highlighted by the fact that there isn't a system for catching ideas from the internal organisation, while there is a system for external people to contribute ideas. Preferably, employees are involved in the early phases of development, as this can improve the success of new services (Häikiö & Koivumäki, 2016; Kitsios & Kamariotou, 2021). The case company could improve employee involvement and engagement both by inviting employees to contribute with suggestions earlier in the development, and by involving more cross-functional teams.

5.3 Processes for managing knowledge and ideas

Formalisation of the innovation process is crucial for focused and effective innovative behaviours, but service innovation is generally less formalised compared to other

functions in an organisation (Ettlie & Rosenthal, 2011). The interviews highlight that a more formalised innovation process is requested. Although the theory concludes that innovation requires structure and formalisation of activities, there are mixed perceptions about this in the empirical findings. While most interviewees agreed, one manager pointed out that creating structure can limit disruptive innovation and the governance around innovation can be a disturbance in itself. It might be true that innovative behaviour cannot be ordered by structure, but a formal process for bringing innovations from ideas to commercialization will likely not be a disturbance. There is no well-defined process for innovation at the case company, except for the NPD process within R&D. The NPD process is mainly focused on products and not services, there's not a particular service development process within the company. From the empirical findings it is also highlighted that new services are recommended to be developed in collaboration with product development, it is difficult to align products and services if they are developed separately. This finding was an interesting contribution to the theory. Earlier research suggests that an innovation process should be collaborative across the organisation as well as externally, but the case company's NPD process is very centralised within R&D.

At the case company there is a need to establish a structured forum that enables individuals to share their ideas, experiences, views, and knowledge, allowing the identification of contributors who can make a significant impact. Since customer integration and external relations are success factors for service innovation (Storey et al., 2015), there is a great amount of information and knowledge to be managed during the service innovation process, but since services are intangible this knowledge can be tacit and difficult to manage. Therefore processes and tools for collating, sharing and storing knowledge are required during development and delivery of services. For manufacturing companies like the case company, processes are usually focused on building products and the organisation revolves around starting a project, developing a product, releasing a product, and selling the product. The intangibility and inseparability of services means that iterative work might be required, and current processes need to be revised.

Since ideas are the starting point for innovation and counted as innovation raw material, it is required to manage them to get a decent quality of ideas that can be used as an input for the next stage of the innovation process. At the case company, input and feedback from customers flow up in the organisation through an informal process which can make it difficult to manage effectively. It is evident that the idea management could be improved at the case company, interviewees are requesting a structure to collect ideas in an organised way, but also a process to select the most valuable ideas to move forward with. It is also important to maintain a record of all ideas, including those that may not be viable in the present but could be useful in the future (Du Preez & Louw, 2008). The empirical findings highlight that the process should have a clear funnel structure, allowing for easy integration of new ideas, even if they are not fully developed. Additionally, interviewees state that the process should be accessible to all team members, allowing everyone to track progress and stay informed about upcoming projects. Organising ideas effectively is a challenge for the case company and an

improved system for collecting and evaluating ideas could improve innovation capabilities.

Without a clear strategy for evaluating ideas, resources can be wasted, and potential innovations may be overlooked. Therefore, it is essential to have a rational and effective model for evaluating and prioritising ideas, which can be used to make informed decisions (Stevanovic et al., 2015). All ideas at the case company need to be approved before they go to pre-development, decisions are usually based on strategic directions and business plans. Interviewees agreed that ideas need to be chosen carefully but pointed out that the case company could be more selective. For a manufacturing firm trying to develop services, having an effective idea management system for services could be especially important according to several interviewees. In general, there is no one size fits all solution as to what ideas should be selected for further development, but the two most important considerations are company objectives and market needs. The empirical findings highlighted that evaluating services can be especially difficult since the main value might be indirect. This calls for a clear strategy on how to evaluate and prioritise new service ideas.

5.4 Technology and digitalisation

So far the case company has not been able to generate much direct profit from advanced services, but still believe that offering services will enable the company to better understand their customers which will lead to better offerings. One of the examples mentioned was the fleet service which is a professional digital service that can be used for data collection that will develop additional profitable services based on the data analysis results. Lenka et al. (2017) highlights the significance of digital transformation and connectivity in customer's value proposition, value creation, and capturing, which can lead to additional profit generation.

Some of the interviewees stated that the case company's innovations are more of a technology push rather than market pull which is a contradiction with the notion of service innovation which is mainly generated by the market and customer need. However, Kitsios and Kamariotou (2021) mentioned that service innovations or new services are often driven by rapid technological change, and technology is still an integral part of service innovation as stated by Häikiö and Koivumäki (2016). The case company plans to use digitalisation to provide information that can help make data-driven decisions to develop new services that improve equipment utilisation, safety and productivity to make the equipment more valuable. The accessibility of data in a transparent manner is one of the key outcomes of digitalisation as discussed by Cijan et al. (2019).

The case company has embedded most of their equipment with connectivity modules and sensors to collect the data related to their equipment and provide it to customers. The data collected from sensors are converted to digital form and transmitted for further use as explained by Parviainen et al. (2017). On the other hand, the end users and construction market are generally not aware of the importance of data analysis, however the rental companies are interested in the data to improve their business and

their control of the equipment. This is connected to what was emphasised by Martín et al. (2018) about the importance of data collection and analysis to understand the related variables that affect servitisation.

The findings showed that the case company is following a similar path in servitisation as explained by Schroeder et al. (2022). The company has started with simple services to augment their product features such as warranty and maintenance, then advanced more by developing additional value adding services with a vision to innovate a variety of advanced services using data analysis and leveraging digitalisation.

5.5 Communication and information exchange

Intangibility of services means that extensive communication and information exchange is required between the firm and the customer, services can be produced and used simultaneously which also requires interaction between the firm and the customer (Sundström et al., 2017). Information from customers is communicated through sales staff at the case company but is generally only delivered if something goes wrong. Several interviewees from the case company agreed that communication needs to happen with both the end users and with dealers or rental companies, but, in practice it has proven to be difficult to reach end users when there is an intermediate channel. Moreover, since product development has limited contact with customers and end users, it is crucial that they can get that information and communication indirectly through the organisation.

The advantage of using an interactive and iterative model of innovation has been highlighted for service innovation (Drejer, 2004; Sundström et al., 2017). The empirical findings support this theory and add that capturing the requirements for new services is often a continuous process that involves learning, testing, and modifying until a solution is developed. Firms need to conduct market research before developing new services and test them with customers before launch (Kitsios & Kamariotou, 2021). Companies that systematically look for new market opportunities and interact more with customers are likely to generate innovations (Ettlie & Rosenthal, 2011). The case company is continuously monitoring the competitor situation and the market as a source of innovation; the company also participates in shows and exhibits as a way to get in front of the customers. The empirical findings show that the case company has a systematic approach to look for market opportunities, although communication with customers could be improved. Digitalisation has also enhanced the opportunities for companies to interact with external stakeholders, the case company aims to use the data it gets from digitalisation in its service offers to customers and believes this could improve its interaction with customers. In this sense the connection between customer involvement and digital services is two-fold, while services require increased communication with customers, digital services also provide opportunities to simplify this communication and add value to the customer.

Idea sources can be customers complaints, employees, suppliers, technology and trends, benchmarking and competitors, current problems or problem areas in the business, company strategies and objectives. It is critical to have functions in place to manage,

capture and communicate these different sources of ideas. Competitors and trends seem to be the main inspiration to innovative ideas at the case company, but most ideas come organically from the different R&D departments. Suppliers and customers are interestingly not considered to be sources of ideas by the majority of interviewees, although the theory stresses the importance of external stakeholders for ideation. As mentioned, the case company's innovations are more of a technology push rather than market pull, at least when it comes to more radical innovations. This could be one reason why the company has struggled with developing new services since the theory states that servitisation is mainly concerned with adding value to the customer and related to the demand-pull phenomena (Frank et al., 2019). Developing ideas internally without collaboration with customers might not be the optimal process, sources of ideas could likely also be found outside of the R&D department.

6 Conclusion

This report aimed to understand how idea management can be effectively conducted in the manufacturing sector to facilitate a servitisation transition. The conclusion has been divided into two sections, one for each research question, in order to answer these clearly and explicitly. Following the conclusion, theoretical contributions, suggestions for future research and lastly managerial implications are presented.

- How can involving customers and employees influence the service innovation process for manufacturing companies?

Involving customers in service development is critical, and the empirical findings have highlighted examples of when not doing so has caused services to fail. Manufacturing firms trying to servitise their offerings need to find a path to reach end users and incentivise distributors to facilitate this connection. Nevertheless, the servitisation transition seems to be easier for firms selling directly to users. For a company like the case company that sells both direct and indirect, increasing the service offering could start in collaboration with direct customers. Manufacturing companies can take advantage of data mining and analysis by adopting communication technologies and digitalisation. Digitalisation could help better understand customers' needs and equipment usage, which in turn can lead to the development of more profitable and value-adding services. Digitalisation is a critical part of servitisation, and these transitions need to be equally prioritised and aligned.

In terms of servitisation, it's essential that employees on all levels are involved to drive this transition. As a manufacturing company ventures into selling services, the required skills of the staff will be different, and training of staff is critical to facilitate a company-wide transition. A forum that enables employees to share ideas and knowledge is recommended. Communication is key and there needs to be a feedback system on what happens with submitted ideas from employees. Generally, service innovation requires firms to collaborate more, internally and externally, and search for innovative ideas outside of R&D. At the case company, R&D staff are rewarded and motivated to come up with new ideas but frontline employees are not incentivised to contribute.

- How does servitisation affect the idea management stage of the innovation process in manufacturing companies?

It was found that the five factors in the analytical framework are essential to the idea management stage of the innovation process and servitisation will make these factors even more crucial to consider. Involvement of customers and employees, processes for managing knowledge and ideas, integration of technology and digitalisation, and communication and information exchange are all key factors of idea management and service innovation, and can therefore be crucial to consider for manufacturing companies on a servitisation journey.

New services are strongly recommended to be developed in collaboration with product development, it is difficult to align products and services if they are developed separately. The empirical findings highlight how misalignment hinders the development of new services and products are instead launched without the intended service. It is critical to have functions in place to manage, capture and communicate innovative ideas. Evaluating new service ideas can be especially difficult since the main value might be indirect, manufacturing firms need to have a clear strategic direction with servitisation to motivate investments.

The findings on the impact of servitisation on the idea management stage during the transition from product-centric innovation to servitisation in manufacturing companies has emphasised the crucial role of idea management as a key factor of the service innovation process. To achieve servitisation, it is vital to tap into a wide range of ideas, particularly those generated by end users, customers, frontline employees, and individuals involved in product development and management. Idea management should receive significant attention, starting with the capturing of ideas from diverse sources and progressing toward their development. It is essential to establish well-defined selection criteria to determine the most promising ideas for further advancement.

While the case company already has several individual and departmental initiatives in place to enhance its idea management process, these initiatives need to be further developed into a comprehensive system that specifically focuses on servitisation. Establishing connectivity solutions and leveraging digitalisation to utilise acquired data will be instrumental in gaining a better understanding of customer needs and developing relevant value-adding services.

6.1 Theoretical contributions and future research

The findings of this research highlight the importance of involving not only customers but also end users in the service innovation process, contributing to Storey et al.'s (2016) article on success factors for service innovation and Ommen et al.'s (2016) research on stakeholder involvement in the service innovation process. It has also been highlighted that most manufacturing companies' linear approach to product development could be adjusted to meet the servitisation requirements better, adding to the theory on service innovation as a political process by Sundström et al. (2017). The idea management stage has proven to be an area of improvement for manufacturing companies looking to servitise their offering, contributing to the research on idea management by e.g. Adams (2005) and Flynn et al. (2003). Since services are usually driven by market demand rather than a push of technology, companies need to widen their search for ideas and adjust current ideation and selection processes accordingly. Finally, this research contributes to the existing theory by highlighting the importance of product-service alignment, contributing to the studies made by Drejer (2004), Ettlie and Rosenthal (2011) and Storey et al. (2016). The findings show that the development of new services and products should be aligned and collaborative to improve the outcome of both offerings. This point is even more significant for developing advanced services such as fleet management systems and connectivity solutions.

Future research in this area could further study the peculiarities of service innovation vs product innovation to better understand if particular areas are also essential for product innovation. The user-manufacturer relationship could be studied further because of its importance to service innovation. Practical suggestions for how manufacturers can connect with users without damaging their relationships with distributors would contribute to the implications of stakeholder involvement. The potential financial benefits for manufacturers to offer services could also contribute to this field of research and support managers in achieving a companywide effort towards servitisation.

6.2 Managerial implications

Leaders play an important role in encouraging and supporting initiatives toward servitisation. To foster effective idea-sharing within the organisation, it is crucial to establish a clear and well-defined process that guides employees on how to contribute their ideas. This process should be communicated to all employees, ensuring their understanding of how to effectively share ideas. Additionally, implementing a rewards system that aligns with the ideas' value and potential can incentivise employees to actively participate in the idea-sharing process. Factors such as patentability and commercialization prospects can be considered when determining the rewards, but traditional considerations should be extended since they might not be applicable to services. For example, most service ideas are not patentable. To ensure a fair and informed selection of ideas, each department should be assigned the responsibility of defining idea selection criteria based on their expertise and level of involvement. This approach allows for a comprehensive evaluation process that takes into consideration the diverse perspectives and insights across different departments.

To drive innovation and maximise both employee and customer involvement, it is crucial to implement a range of strategies. Firstly, engage and empower employees by highlighting their importance and demonstrating how their ideas can add value to the company and customers. Communicate the value of innovation clearly, emphasising its benefits to the company's growth and customer satisfaction. Encouragement and motivation for idea sharing could be strengthened by management support. Managers could foster collaboration between technical and business teams to leverage diverse expertise. Development teams need to be given enough space, time, and resources to test and develop their ideas. For customer involvement, listen to customer requirements, pains and gains, then prioritise needs and opinions, particularly during the shift to servitisation. Incentivise and facilitate customer engagement through dedicated platforms, while establishing effective feedback mechanisms to keep customers updated on the status of their ideas. Lastly, implement a motivating reward system to recognize and appreciate successful ideas. By implementing these strategies, the organisation can foster a collaborative and inclusive environment that drives innovation and enhances customer satisfaction.

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Appendix 1 - Interview structure

Part one: Introduction

- 1- Interviewee introduction.
- 2- Interviewee perception about the case company's innovativeness
- 3- Interviewee involvement in the innovation process.

Part two: Ideation

- 4- Innovative ideas sources.
- 5- Engagement, motivation, and rewards.
- 6- Ideas capturing.
- 7- Ideas categorization and selection.
- 8- Existing systems and practices.

Part three: Product and service innovation, servitisation and digitalisation.

- 9- Differences between physical products and services innovation.
- 10- Digitalisation meaning and importance.
- 11- Importance of servitisation.
- 12- The role and challenges in digitalisation.
- 13- Transition challenges from manufacturing to product-services and services offering.

Part three: Towards servitisation and digitalisation

- 14- Importance of customer feedback and data analysis.
- 15- Strategies of identifying digital opportunities
- 16- The importance and skills of frontline teams.
- 17- Alignment between products and services innovation.

Part four: Conclusion

18- Challenges and general observations

19- Special considerations

20- Recommendation

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