Company-X

Organizational structure: how to offer a product-service system?: A multiple case study.

Master Thesis Business Administration

Lars Prinsen

COMPANY-X| UNIVERSITY OF TWENTE|
ENSCHEDE| 27/05/2020|

Master Thesis

Organizational structure, how to offer a product-service system?: A multiple case study.

Study:	Master Business Administration
Faculty:	Faculty of Behavioural, Management and Social Sciences
P.O. box:	P. O. Box 217
Postal code:	7500 AE Enschede
Country:	The Netherlands
Company:	Company-X N.V.
Place:	Enschede
Thesis period:	22/04/2019 until 27/05/2020

Author: UNIVERSITY OF TWENTE. Lars Prinsen
L.prinsen@student.utwente.nl

Supervisors: UNIVERSITY OF TWENTE. Prof.Dr.Ir. L.J.M. (Bart) Nieuwenhuis
University of Twente
Enschede

UNIVERSITY OF TWENTE. X. Stegehuis MSc.
University of Twente
Enschede

Company-X Ir. A. Erikson
COMPANY-X
Enschede

Preface

On 22 April 2019, I started working on my master thesis to complete the master Business Administration at the University of Twente. At the beginning of this trajectory, I only had a vague idea about what I would like to research. Writing this master thesis was sometimes confusing and frustrating, but in the end, it was mainly a learning process in which I also discovered more about myself. It was very interesting to explore the topics of organizational structures in a servitization context, combining both practical experiences from previous studies and theoretical knowledge. However, after a trajectory of ups and downs, I am proud to present my master thesis.

Although I have put a lot of time and effort into this research, I have not been able to achieve these results on my own. That is why I would like to thank several people who have helped me throughout the whole process. First of all, I would like to thank my supervisors from the University of Twente, Prof. Dr. Ir. Bart Nieuwenhuis and PhD candidate Xander Stegehuis, for their time, knowledge and experience. Especially the critical feedback I received during the project has helped me a lot to improve and shape the result. Besides, I would like to thank my supervisors at Company-X for the possibility to carry out this research in the business world. Furthermore, I would like to thank the respondents for their participation in this research. In addition, I would like to thank my colleagues within Company-X, especially the fellow graduates, for sharing experiences, connections, feedback, brainstorming sessions and the necessary healthy distractions. Besides colleagues, I also have several new friends. In addition to the research, I have also developed a lot of interest in Company-X. Therefore, I hope that in the near future I can be of value to this organization with its great corporate culture.

Lars Prinsen
27-5-2020

"To accomplish great things, we must not only act, but also dream; not only plan, but also believe."
-Anatole France

Abstract

In servitization literature, many authors have described which business areas need to be adapted to achieve a positive servitization performance. One area that is often described as a success factor related to servitization performance is the organizational structure. However, literature research has shown that in addition to the structural dimensions, several contextual factors have an impact on organizational design. As a result, within this exploratory research, a viable organizational structure has been examined in order to offer product-service systems. Emphasis has been placed on the, servitization degree, the structural organizational dimensions (de)centralization, departmentalization, formalization, hierarchy (of authority), responsibilities, specialization, and the contextual factors culture, commitment, (cross-functional) communication, flexibility, infrastructure and synergies. A multiple case study at a technology-driven software company has been performed, because within the company a research group is currently developing a new product-service offering. Furthermore, the company consists of multiple business-units who are servitizing or already made the transition. Subsequently, a method was developed that uses both quantitative and qualitative methods to generate in-depth insights into the various organizational structures and the associated contextual factors per business unit. Analysis has shown that a viable organizational structure should be vertically decentralized in which employees have a high degree of autonomy and freedom of doing business. Furthermore, the structure should be departmentalized based on function, where different teams are responsible for a part of or a task related to the offering. These teams have to find the right balance regarding formalization in order to create transparency, clarity and frameworks regarding quality. In addition, the infrastructure has to be focused on gathering and sharing information, with an emphasis on translating market need, market complexity and feedback.

Keywords: Servitization, organizational structure, structural organizational dimensions, contextual factors, product-service offering, case study research.

Due to the strict company regulations regarding confidentiality, certain parts of the text in this document have been deleted.

List of Figures and Tables

Figures.

Tables.

Table of Contents

1.0 Introduction

As a result of environmental changes, an increasing number of industries are confronted with the intensification of external competitive pressures (T. Baines & Lightfoot, 2013, 2014; Daft, Murphy, & Willmott, 2014; Gillior, 2018; Kirchmer, Franz, Lotterer, Antonucci, & Laengle, 2016; Somaya, Williamson, & Lorinkova, 2008; Srai & Lorentz, 2018). Markets are more complex than ever before and have undergone a high degree of change, wherein consumers gained more power and are more demanding (Galbraith, 2002). Product innovation could be used to convince customers (T. Baines, Lightfoot, Benedettini, & Kay, 2009; Windahl, 2007). However, declining growth, commoditization of manufacturing goods, and declining profits in core-markets resulted in the fact that product innovation alone is no longer sufficient to ensure profitability. Therefore, manufacturers have to find new ways of achieving a (sustainable) competitive advantage (Antioco, Moenaert, Lindgreen, & Wetzels, 2008; Baines & Lightfoot, 2014; Baines et al., 2009; Eloranta & Turunen, 2015; Gebauer, Ren, Valtakoski, & Reynoso, 2012; Vandermerwe & Rada, 1988). As a consequence, manufacturers are gradually making the shift towards more service and solution-based strategies, wherein products alone are no longer being sold. Instead, products are offered as an integrated offering that consists of a combination of products and services (T. Baines et al., 2009; Eloranta, 2016; Mathieu, 2001; Oliva & Kallenberg, 2003; Vandermerwe & Rada, 1988). This transition is also known as *'servitization'* (T. Baines & Lightfoot, 2014; T. Baines et al., 2009; Oliva & Kallenberg, 2003; Vandermerwe & Rada, 1988).

Servitization was first mentioned by Vandermerwe and Rada (1988), who observed that companies started to offer fuller market packages, bundles of customer-focused combinations of goods, services, support, self-service and knowledge. According to Vandermerwe and Rada (1988); *"servitization is happening in almost all industries on a global scale. Swept up by the forces of deregulation, technology, globalization and fierce competitive pressure, both service companies and manufacturers are moving more dramatically into services" (p. 315).* Furthermore, it was notified that services began to dominate (Vandermerwe & Rada, 1988). The movement was called *the servitization of business*, which was leading to new relationships between the companies and their customers. As more research was done into servitization, the definition changed as more became known about the topic. For this reason, Lightfoot, Baines and Smart (2013) redefined servitization as; *"the transition in business model from products to product-service systems (PSS), where product and services are bundled to generate higher use-value, pricing is based on value, and capabilities support customer-dominant orientation"* (p. 1423). Product service system (PSS) are hybrid solutions, including technological elements and service elements that are integrated, which focuses on creating a higher value for customers by solving customer problems and simultaneously providing them with all the product benefits without necessary ownership (Berkovich, Leimeister, Hoffmann, & Krcmar, 2014; Dimache & Roche, 2013; Rabetino, Harmsen, Kohtamäki, & Sihvonen, 2018; Shimomura, Nemoto, & Kimita, 2015).

A firm's ability to create attractive business models is one of the key challenges for firms to successful transition towards offering solutions (Coreynen, Matthyssens, & Gebauer, 2018). Oliva and Kallenberg (2003) captured the servitization transition of companies in a continuum that ranges from pure product providers to pure service providers. Nonetheless, it is often discussed that the servitization process is not following the proposed continuum (Ducq, Chen, & Alix, 2012; Visnjic, Wiengarten, & Neely, 2016; Wiesner, Peruzzini, Doumeingts, & Thoben, 2013). However, there is consensus that servitization is not a simple process and requires organizations to adapt multiple organizational aspects, such as strategy, structure, culture, processes and skills (T. Baines & Lightfoot, 2013; Bigdeli, Baines, Bustinza, & Shi, 2017). The topic regarding servitization and challenges has been researched well by multiple researchers over the years (Alghisi & Saccani, 2015; T. S. Baines, Lightfoot, & Kay, 2009; Brax, 2005; Fliess & Lexutt, 2019; Gebauer, Fleisch, & Friedli, 2005).

A servitizing organization needs to overcome the transition related challenges in order to successfully offer a product-service system. Servitization is seen as a transition to achieve financial, strategic, marketing and environmental benefits that help to achieve competitive advantage (T. Baines & Lightfoot, 2013; T. Baines et al., 2009; Mathieu, 2001). During the implementation of servitization, companies face challenges who are amongst others linked to strategy formulation, organizational culture, organizational structure, service portfolio, supplier relationships and service development (Alghisi & Saccani, 2015; T. Baines et al., 2009; Martinez, Bastl, Kingston, & Evans, 2010). Implementing the aforementioned changes are considered critical to the success of the service transition. During the transition, companies shift their emphasis from selling standardized products to offering customized solutions (Bigdeli & Baines, 2017; Gebauer, Edvardsson, Gustafsson, & Witell, 2010; Gebauer et al., 2005; Kohtamäki, Baines, Rabetino, & Bigdeli, 2018). However, Kinnunen and Turunen (2012) state that it is not necessary that the company as a whole has to be servitized. According to Kinnunen and Turunen (2012), the change takes place in organizational units or divisions and realizes in the way this division or unit deals with customers, in the way it delivers value, by earning logic, and finally in the organizational structure (Kinnunen & Turunen, 2012, p. 73; Turunen & Finne, 2014). Moreover, it is suggested that units or divisions capable of exploring new opportunities should be identified and supported in the servitization transition (Bigdeli et al., 2017; Fliess & Lexutt, 2019; Gebauer et al., 2005; Neely, 2008). However, during this transition investments have to be done, in for example the infrastructure, organizational design, capabilities and resources, to successfully servitize (Bigdeli et al., 2017; Fliess & Lexutt, 2019; Gebauer et al., 2005; Moore, 1991; Neely, 2008). Nevertheless, not all servitization related investment outcomes are certain and have a positive effect on firm performance (Gebauer et al., 2005, 2012; Neely, 2008).

Unfortunately, not all servitization related investments may result in increased firm performance (Gebauer et al., 2005, 2012; Visnjic Kastalli & Van Looy, 2013). The phenomenon that the service transition investments have a negative outcome for the company is referred to as the service paradox (Brax, 2005; Gebauer et al., 2005). According to Gebauer et al. (2005), manufacturing firms risk becoming subject to the service-paradox when the challenges concerning the transition are not met. However, multiple servitization studies found a non-linear positive effect on company performance, which means that servitizing companies first have to go through a dip and then experience positive effects of their servitization efforts (Fang, Palmatier, & Steenkamp, 2008; Kohtamäki et al., 2018; Kohtamäki, Partanen, Parida, & Wincent, 2013; Visnjic et al., 2016). According to Fang et al. (2008), the tipping point lies at 20% - 30% service turnover compared to the total turnover. Moreover, Crozet and Milet (2017) found quantitative evidence that servitization leads to an increase in profitability and workforce size (Crozet & Milet, 2017). In addition, Doni, Corvino, Bianchi and Martini (2019) state that servitization, especially PSS, can be interpreted as an opportunity to achieve better environmental performances because the product life cycle can be extended and therefore reduces the ecological impact. To be more specific, it is suggested that servitization can affect sustainability by reducing the environmental impact by balancing economic, environmental, and social issues (T. S. Baines et al., 2007; Doni et al., 2019). In order to experience as many positive effects of servitization as possible, companies need to make the transition successfully.

The performance of servitization is determined by a configuration of multiple dimensions (T. Baines, Lightfoot, Smart, & Fletcher, 2013; Gebauer et al., 2005; Kohtamäki et al., 2018). Nonetheless, according to Fliess and Lexutt (2019), there is no consensus on the critical factors that impact on the success of transitioning towards a competitive servitization strategy. In their latest research, Raddats, Burton, Zolkiewski, and Story (2018) identified four challenges, including determining the correct organizational structure to deliver the service strategy. Even when organizations are transforming their businesses from product-oriented to service-oriented, without overcoming the structural reorganization challenge, its efforts may not be effective (Alghisi & Saccani, 2015).

One of the central discussed questions in literature is the appropriate organizational structure for services in manufacturing, which focusses mainly on the question whether to integrate or separate a service business unit (Fliess & Lexutt, 2019; Neu & Brown, 2005; Oliva, Gebauer, & Brann, 2012; Oliva & Kallenberg, 2003). The establishment of this service organization intensifies the service business and emphasizes strategic commitment (Gebauer et al., 2005; Kohtamäki & Helo, 2015). Furthermore, research has proven that the independent (separated) service organization has a positive impact on firm performance (Gebauer, Edvardsson, & Bjurko, 2010; Oliva et al., 2012). On the other hand, researchers argue that the service organization should be integrated into the organization, because it enables synergies and knowledge spillovers (Neu & Brown, 2005, 2008). Nevertheless, cross-functional communication, decentralized decision making, and information sharing are agreed on to be important aspects of integrating services and products (Antioco et al., 2008; Biggemann, Kowalkowski, Maley, & Brege, 2013; Eggert, Thiesbrummel, & Deutscher, 2014; Kucza & Gebauer, 2011; Neu & Brown, 2008). In addition, according to Auguste, Harmon and Pandit (2006), the choice of integration or separation depends if the strategic objective of the services is designed to 'defend' existing product business or to 'grow' the business. The appropriate organizational structure depends on multiple 'success' factors such as organizational culture and servitization strategy (Fliess & Lexutt, 2019; Gebauer, Friedli, & Fleisch, 2006; Kowalkowski, Kindström, & Witell, 2011; Oliva & Kallenberg, 2003).

Multiple studies have been conducted on the topic of servitization and the best organizational structure. However, the scope of these studies differs a lot and is rather limited. For example, Gebauer studied the service-environment fit, strategy organizational design fit and the linkages between service strategies, success factors for high revenue, and a combination of the business environment and value chain positioning (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010; Gebauer, Fischer, & Fleisch, 2010; Gebauer & Fleisch, 2007; Gebauer et al., 2005). If the organizational structure is insufficiently addressed, there might be major (financial) consequences for the organization (Benedettini, Neely, & Swink, 2015; Bustinza, Bigdeli, Baines, & Elliot, 2015). According to Benedettini et al. (2015), misalignment of services within organizational structures entails significant costs and risks, as manufacturers are exposed to more internal failure risks, thereby increasing the likelihood of bankruptcy. Many studies talk about 'the best' organizational structure or the alignment of structural elements, but these studies do not discuss the organizational structure to a detailed level that deals with certain design specifications or compositions of structure related elements. It is not clearly described in the servitization literature how certain organizational structures have been designed to prevent misalignment and avoid servitization related risks.

In this research, the following description of Daft et al. (2014) is chosen as leading. Organizational structure, as described by Daft et al. (2014), is aimed at achieving two things. At first, the organizational structure aims to provide framework of groupings, reporting relationships, and responsibilities. Second, the organizational structure is aimed at providing mechanisms to link and coordinate organizational elements into a coherent whole, in order to achieve goals, administer the strategy and link to the external environment (Chandler, 1962; Daft et al., 2014; Jacobides, 2007; Stacey, 2007). Since structure follows strategy, Neu and Brown (2008) investigated how organizations should design a structure that fits both the market and the service strategy (Chandler, 1962; Mintzberg, 1979b). Building on these outcomes, Gebauer et al. (2009) researched the topic of service orientation in organizational structures and stated that elements that contribute to the service orientation include corporate culture, human resource management, organizational structure, total offering, and the business strategy. However, in order to facilitate the required changes at the organizational and strategic levels resources, competencies and capabilities need to be employed first (Fliess & Lexutt, 2019; Raddats, Story, Burton, Zolkiewski, & Baines, 2014).

In order to link and coordinate different organizational elements, most of the organizational structures are designed by multiple structural and contextual dimensions, like (de)centralization, formalization, hierarchy and control (Daft et al., 2014; Mintzberg, 1979b; Robbins & Coulter, 2015). The structural dimensions provide a basis for comparing organizational compositions, while contextual dimensions characterize both the organization as a whole and the broader organizational setting. These contextual dimensions may tell why the organization designed its structure as it does (Daft et al., 2014; Mintzberg, 1979b). According to Daft et al. (2014), an effective organization has a smooth, well-oiled internal process wherein employees are focused and satisfied, and the department's activities are coordinated to ensure high productivity. However, there are several reasons why deficiencies, like a delay in decision making or decisions lacking quality, pop up in the organization. These delays or quality lacking decisions can be caused by hierarchy funnels who are directing too many problems and decisions to certain places in the organizational structure (Cunningham, 1977; Daft et al., 2014; Galbraith, 2002; Mintzberg, 1992). However, to understand and evaluate organizations, it is of importance to examine and consider the influence and interactions between multiple dimensions (Daft et al., 2014).

Many authors have researched and discussed the impact of structural- and contextual dimensions, and success factors on organizational structure and its performance. (Daft et al., 2014; Galbraith, 2002; Mintzberg, 1992; Robbins & Coulter, 2015). However, there still is a considerable amount of ambiguity about what a viable organizational structures is in the context of servitization (Kinnunen & Turunen, 2012; Raddats & Burton, 2011). Nonetheless, it can be stated that organizational structures in servitization literature mainly have been discussed in terms of a strategy structure fit, and whether to integrate or separate the service business unit (Ahamed, Kamoshida, & Inohara, 2013; Gebauer et al., 2006; Raddats & Burton, 2011; Raddats, Kowalkowski, Benedettini, Burton, & Gebauer, 2019; Turunen & Finne, 2014). However, delivering services and solutions requires organizations to reconfigure themselves to meet specific customer needs (Bustinza et al., 2015; Gebauer, Edvardsson, Gustafsson, et al., 2010; Gebauer & Kowalkowski, 2012). Consequently, the organization requires restructuring to facilitate the delivery of services and solutions (Storbacka, 2011; Windahl & Lakemond, 2006). Nonetheless, the dimensional aspects of organizational structures have not yet been explored in servitization literature, despite the fact that these factors and dimensions can contribute positively to servitization performance (Daft et al., 2014; Mintzberg, 1992). Studying the structural and contextual dimensions in a servitization context generates valuable insights on a more detailed level regarding the design of organizational structures that meet the needs of servitizing organizations. Thus, these insights can guide servitizing companies struggling to find a viable organizational structure to achieve success.

In summary, it can be stated that there is little empirical research that describes how organizations should structure their organizations taking the structural dimensions of organizational structure into account. Therefore, there is a gap in the servitization literature regarding the organizational structure challenge, taking the structural organizational dimensions lens into account during the design. Furthermore, there is limited attention for the appropriate structural fit and the potential barriers and challenges that organizations face regarding servitization. As a result, this research addresses the following research objective, namely to generate more detailed and specific insights into how servitizing organizations should configure the organizational structural dimensions in order to offer product-service systems. Moreover, the contextual factors culture, commitment, communication, flexibility, infrastructure and synergies are taken into account as moderating variables. Eventually, a well-founded recommendation will be made regarding a viable service-oriented organizational structure. As a result, the research aim reflected in the following research question:

" What is a viable organizational structure to offer a product-service system?"

This research makes contributions to the field of organizational structures in a servitization context. At first, this research supplements and enriches the knowledge about servitization and organizational structures by exploring the composition of the structural organizational dimensions. Furthermore, insight is created into the importance of the contextual factors and structural dimensions that impact the choice regarding a viable organizational structure to offer product-service systems. These contextual factors have been derived from the literature that focusses on the second proposition proposed by Fliess & Lexutt (2019), organizational design, structural organizational dimensions, and contextual dimensions. This research will contribute to the relationship between the characteristics of organizational structures from the perspective of structural organizational dimensions, and the overall performance of servitization. Moreover, a method is proposed to gain insight to form an organizational structure to offer product-service systems, taking servitization related capabilities, contextual factors, and structural dimensions related to servitization into account. Based on Rabetino et al. (2018), multiple definitions of different communities, clusters and research streams, it was determined that this research problem can be seen as part of the PSS community. This community addresses design- and sustainability-related concerns and is oriented toward selling functionality instead of products while considering social, environmental- and ownership-related aspects (Rabetino et al., 2018). To be more specific, this problem is part of the PSS development stream, which is part of the PSS design and development cluster, because this stream focuses on the integration of PSS solutions and combines engineering- and business-oriented approaches, while the other streams are oriented on selling functionality instead of products and on requirements for engineering and ICT-aided modelling and development of value propositions (Rabetino et al., 2018). The PSS development stream focuses on the mixture of PSS solutions and therefore merges engineering- and business-oriented concepts such as operation strategies and management. One of the central topics in the PSS development stream is the organizational structure (Rabetino et al., 2018). Appendix I includes a visualization of the several communities, clusters and streams that are related to the servitization-related research. All research related subjects are marked green in Figure 34 (Appendix I).

2.0 Literature Review

2.1 Servitization

Before servitization was recognized as a competitive tool, there was a clear distinction between manufacturers and service providers. Fundamentally, companies fitted into being in goods or services (Vandermerwe & Rada, 1988). The clear distinction between both started to fade in time, also shifting the nature of the customer interaction from transaction-based towards relationship-based (T. Baines et al., 2009; Martinez et al., 2010). Nowadays, the portfolio of many manufacturers consists of products and corresponding services, or a complex bundling of products and services (Bigdeli et al., 2018). Twenty-one years after the first introduction of the servitization Baines et al. (2009) redefined servitization as; *"the innovation of organizations capabilities and processes to better create mutual value through a shift from selling products to selling integrated product-service systems"* (p. 555). Ahamed, Inohara and Kamoshida (2013) see servitization as a strategic approach and a fundamental movement whereby manufacturing firms move from not only producing goods to offering a combination of goods and services in a single "value package". Additionally, manufacturing firms collectively meet the client's needs in a single space. According to Baines and Lightfoot (2013), the essence of the servitization transformation for manufacturers is to offer integrated sets of products in combination with services in order to differentiate, compete, and sustain. Therefore, servitization not only involves the innovation of service offering, it also involves the innovation of the internal capabilities in operations (Baines & Lightfoot, 2013). This definition is quite similar to the definition of Lightfoot, Baines and Smart (2013), who define servitization as; *"the transition in business model from products to PSS, where product and services are bundled to generate higher use-value, pricing is based on value, and capabilities support customer-dominant orientation"* (p. 1423). A more simple definition of servitization is; *"the transformational process from product-centric to service-oriented business models"* (Kowalkowski, Gebauer, & Oliva, 2017). PSS play an important role during the servitization process and not only the service offerings have to be redesigned. In this research, we choose to use the following definition of servitization introduced by Lightfoot, Baines and Smart (2013), because it covers important aspects of servitization, like the importance of PSS, the aspect of value, pricing, capabilities and the transition process. All these aspects concern topics related to the central research question. For this reason, we believe that this is the most appropriate definition of servitization that fits the characteristics of this research.

2.1.1 Servitization process

The current servitization literature discusses two conflicting perspectives regarding the servitization transition. The most familiar perspective focuses on the transition of companies along a unidirectional product-service continuum proposed by Oliva & Kallenberg (2003). During the transition, manufacturing companies are moving from selling products to selling combinations of products and service systems. Therefore, the continuum ranges from pure-product manufacturers, positioned along the far left, towards pure-service providers, with products as an add-on, positioned on the far right of the continuum, see Figure 1 (T. Baines et al., 2009; Oliva & Kallenberg, 2003).

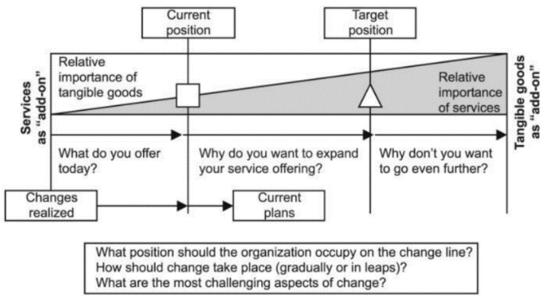

Figure 1 Service continuum (T. Baines et al., 2009; Oliva & Kallenberg, 2003)

The continuum approach is based on the idea that companies must first develop proficiency in providing certain basic product-related services before moving towards the right of the continuum. As noted by Gebauer, Bravo-Sanchez & Fleisch (2008) companies should look at their unique opportunities and challenges at different levels of "service infusion" and consciously determine their position on the continuum. Repositioning is seen as a dynamic process, in which companies redefine their position over time and evolve towards increasing dominance in service provision. According to Fang, Palmatier &

Steenkamp (2008), service transition strategies are more successful when related to the firms' core business. This is in line with Oliva & Kallenberg (2003) and Baines & Lightfoot (2013) who state that companies that do not develop proficiency in providing basic product-related services are more likely to fail in their overall servitization efforts.

According to Oliva and Kallenberg (2003), durable manufactured products require services as the products advances in their life cycle. These products are associated with a cost of ownership beyond the purchase price. During the transition towards service providers, Oliva and Kallenberg (2003) distinguished four stages. During each stage the company focuses on a set of issues, which are addressed by developing new related capabilities. The integration of products and services, also providing a capability, creates a shift of the risk and responsibilities towards manufacturers. To deal with this challenge manufacturers have to organize their organization in such a way that it is still capable of providing this capability and it bears the additional responsibilities and risks. When looking into the different stages it is noted that stage three is split up into two simultaneous stages, see Figure 2. For this reason we will speak of five different stages.

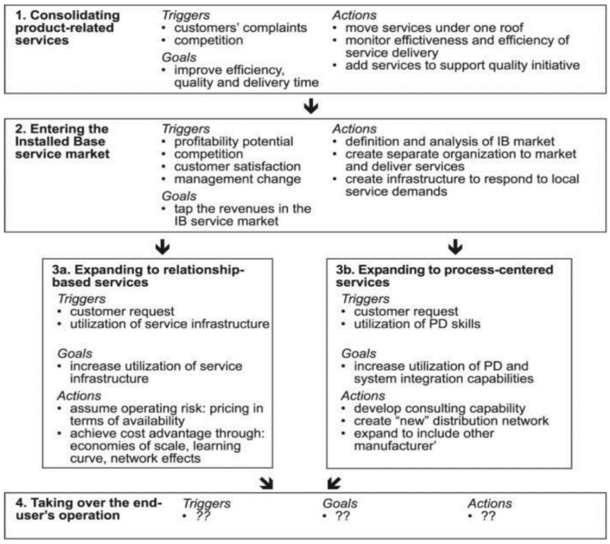

Figure 2 Stages of servitization process by (T. Baines et al., 2009; Oliva & Kallenberg, 2003)

Nonetheless, it is often discussed that the servitization process is not following the proposed continuum (Ducq et al., 2012; Visnjic et al., 2016; Wiesner et al., 2013). In the course of time, different servitization processes have been proposed, while the process itself evolved (Ducq et al., 2012; Visnjic et al., 2016; Wiesner et al., 2013). According to Wiesner, Peruzzini, Doumeingts and Thoben (2013), the emergence of servitization creates the need for new models that link products, product-related services and the customer's needs (Ducq et al., 2012; Wiesner et al., 2013). In order to enhance the overall attractiveness of the offering companies need to package their core products with services, see Figure 3. By offering added value through product extensions competitive advantage can be gained (Ducq et al., 2012; Wiesner et al., 2013). According to Ducq, Chen, and Alix (2012) the servitization process consists of four stages, see Figure 4.

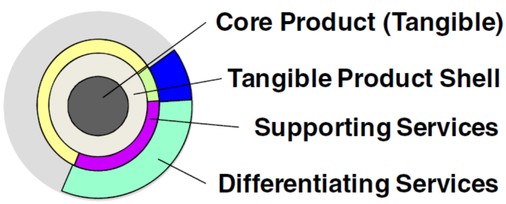

Figure 3 Core product packaging (Ducq et al., 2012)

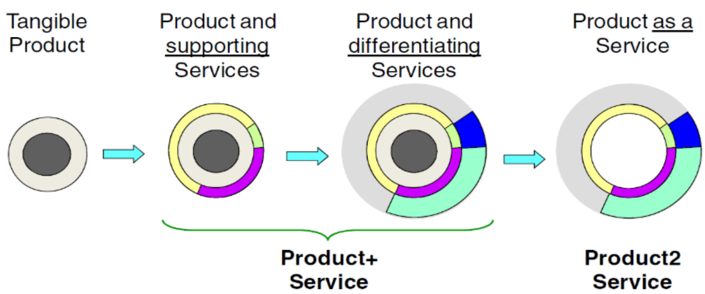

Figure 4 Servitization process (Ducq et al., 2012)

The first stage is the selling of the product whereas differentiation from other companies is achieved by competitive pricing, quality and functionalities of the product. In the second stage, which initializes the servitization process and the evolution towards a PSS, simple supporting services are added to the product. This is comparable with product and supporting services, like maintenance and repair. The services can be purchased separately and are rather seen as marketing instruments and add-ons (Ducq et al., 2012; Wiesner et al., 2013). The third stage is an evolution of the second stage and is focused on increasing differentiation. In this stage, the product is still sold separately but is now complemented with services that differentiate the offer from competitors. Services that provide additional functionalities and individualize the product are based on the individual customer requirements and charged separately. These services are more focused on supporting the customer than on the maintenance of the product (Ducq et al., 2012; Wiesner et al., 2013). In the fourth stage, the customer purchases bundled services that deliver a solution or capability to the customer's specific problem. In contrary to the previous phases, the core tangible product has been omitted. The core product is still part of the total offering but it is used to provide the services. Therefore, the revenues in this stage derive from the services, whereby the physical good and services are decoupled. In most cases the service provider still owns the core product, which in this stage is considered an investment. The characteristics of the product in this stage are less essential to the customer. Therefore, this is the highest level of servitization. Furthermore, the development of product and services is integrated into the business model (T. Baines & Lightfoot, 2013; Ducq et al., 2012; Opresnik & Taisch, 2015; Wiesner et al., 2013).

However, according to the recent study of Baines, Bigdeli, Sousa, and Schroeder (2020) manufacturers undergo four stages of organizational maturity, namely exploration, engagement, expansion and exploitation. As a result, an organization develops according to the pressure of five main forces, namely customer pull, technology push, value network positioning, organizational readiness, and organizational involvement. Moreover, Baines et al. (2020) conclude that at a macro-level progression from stage to stage appears to be unidirectional and linear. However, within each stage the activities aimed at promoting servitization are organic, intuitive and repetitive. In addition, at macro-level, progress from one to the next stage is interrupted by tipping points, which only occur when activities on the prior phase prove sufficient value in order to move on towards the next stage (T. Baines et al., 2020). Therefore, servitization can be seen as both a transition, in which companies move from products to services, and a transformation, suggesting that servitization is more of a shift where earlier stages are embraced and built upon. However, throughout this research, we will favour servitization as a transition in order to avoid any confusion regarding the chosen definition and also to create uniformity.

2.1.2 Drivers

In many occasions, servitization is driven by the aggressive competition of emerging economies, low-cost countries and highly matured markets. This makes it seem as if servitization is externally driven. Actually, the recognition and potential for servitization are based on certain drivers. The initial drivers fall into two categories, namely defensive and offensive drivers. Defensive drivers are concerned with the improvements in cost savings, predictability, and business efficiencies. On the other hand, offensive drivers focus on improvements in focus, growth, and business competitiveness (T. S. Baines, 2013). In general, there are multiple drivers to pursue a servitization strategy, namely financial, strategic, marketing, and environmental drivers. The driver's benefits will appear on different levels of the company (T. Baines & Lightfoot, 2013; T. Baines et al., 2009; Mathieu, 2001). At first, the drivers of the servitization are elaborated from the business perspective, after which the drivers are discussed from the customer perspective.

***Financial* -** By offering the product as a service, continuous revenue streams throughout the entire product lifecycle are generated. As a result, these revenue streams increase the predictability and generate certain stability of income (T. Baines & Lightfoot, 2013). However, after offering the product as a service a drop in sales may occur, which will give way to a gradual flow of revenue in order to boost commercial viability (T. Baines & Lightfoot, 2013; Fang et al., 2008). The majority of this gradual revenue flow is moving downstream towards services and support. As a consequence, companies become less sensitive to compete by means of product pricing. Additionally, it is argued that services have higher profit margins than products. According to Baines & Lightfoot (2013), the service profit margins could be two till three times higher than profit margins for products. Servitization can help to balance the impact of mature markets and adverse economic cycles (T. Baines & Lightfoot, 2013; T. Baines et al., 2009; Gebauer et al., 2005; Oliva & Kallenberg, 2003).

Strategic **-** The second general driver focuses on the fact that companies have to find new ways of achieving a (sustainable) competitive advantage due to commoditization of manufacturing goods and declining profits in core-markets (Antioco et al., 2008; T. Baines et al., 2009). One way to gain competitive advantage is by differentiation because services tend to be less tangible, more difficult to imitate by competitors, and more labour dependent (T. Baines et al., 2009; Mathieu, 2001; Oliva & Kallenberg, 2003). From a strategic perspective, the intangibility and the fact that services are harder to imitate may cause competitor lock-out (T. S. Baines, 2013). Furthermore, by offering higher level and tailored services and solutions, the overall attractiveness increases and the possibility to lock in customers into a long term relationship occurs. By offering tailored solutions and services manufacturers try to meet the customers' needs in order to increase the customer dependency and barriers for competition (T. Baines et al., 2009; Turunen, 2013).

Marketing **-** The third main driver, marketing, generates multiple opportunities for companies. Due to the maturing technology and the increasing customer interaction manufacturers gain deeper insights into the customers' needs. These insights lead to the development of tailored and improved offerings, which eventually results in influencing purchasing decisions. Therefore, services can be used to increase first-time and repeat purchases customers. Consequently, manufacturers are in a better position to offer tailored offerings, which strengthens the position to achieve differentiation (T. Baines & Lightfoot, 2013; T. Baines et al., 2009; Mathieu, 2001). By focusing on customer centricity and customer intimacy, the number of contact moments and touchpoints with the customer increases. This results in opportunities for the manufacturer to strengthen customer relationships, improve tailored solutions, and increase the number of repeat purchases (Atos Consulting, 2011). This is in line with Fang et al. (2008) who state that the changing characteristics of the total offering result in intangible relationships wherein brand assets become more valuable to customers. Thus, creating higher customer loyalty, more cooperativeness from a customer perspective, more pricing power, and greater opportunities to cross- or upsell.

Environmental **-** The PSS stream in the literature takes the environmental perspective as the starting point for the analysis of servitization, because of the global energy consumption and population growth (T. Baines & Lightfoot, 2013; T. S. Baines et al., 2007; Rabetino et al., 2018). Servitization encourages companies to take into account the entire lifecycle of their products. Partly because of this stimulus, servitization can lead to dematerialization. Servitization can lead to life-cycle extension, allowing companies to deal with services that take place around the end of life. These services include the return, recycling and renovation of equipment for re-use. The environmental impact of the products may be reduced as a result of companies being encouraged to reduce their energy and material costs during this life cycle (T. Baines & Lightfoot, 2013; T. S. Baines et al., 2007; Doni et al., 2019; Mathieu, 2001).

Customer perspectives - There is a difference between the defensive drivers for servitization for manufacturers and customers. According to Baines (2013), the desire for cost saving is prevalent for customers. In addition, customers' defensive drivers are focused on financial, asset, and risk management. The offensive drivers, from a customer perspective, focus mainly on the search for improved focus, investment and performance (T. S. Baines, 2013; Salonen, 2011). The customers' perspective on the drivers of servitization is stimulated by a market pull. In addition, Turunen (2013) states that customers also have the willingness to outsource peripheral activities, which enables them to focus on their core activities again (Holcomb & Hitt, 2007; McIvor, 2009).

2.1.3 Servitization Strategies

The continuum perspective is generally complemented by views that relate to the strategic perspective of servitization. Furthermore, in order to understand and evaluate organizations, it is of importance to examine and consider their strategies, offerings, capabilities and the market wherein the organizations are active (Cunningham, 1977; Hara, Sato, & Arai, 2016; Mintzberg, 1990). For these reasons, different strategic perspectives and servitization strategies will be elaborated. The servitization strategies are often related to the nature of the (service) offering. Therefore, chapter 2.1.4 addresses the types of offering. Nonetheless, multiple typologies of servitization strategies are appointed. However, the typologies of Gebauer (2008) are most widely adopted, thus these will be explained in more detail. For more detailed explanations of the other appointed strategic typologies, see Appendix II (Servitization strategies).

There are multiple service strategies that companies can implement to reach their goals. Mathieu (2001) distinguishes three different service strategies, namely internalizing, partnering, and outsourcing wherein internalizing and outsourcing are two extremes. On contrary, Neely (2008) looks at servitization strategies from a more product-service system perspective. Neely (2008) states that there are five different forms of product-service systems, namely integration oriented, product-oriented, service-oriented, use oriented, and result-oriented systems. Nonetheless, Raddats and Easingwood (2010) determine their strategies on the basis of two service conditions. At first, the strategies are determined whether services are primarily focused on products or activities in the customer's operational environment. Second, whether the services only relate to own-brand products or also include other OEM products. Based on these conditions four service strategies have been specified, namely services engagement, services extension, services penetration, and services transformation. Gebauer (2008) describes four different service strategies who are based on a specific set of service offerings, namely after-sales service provider strategy (ASPs), customer-support service provider strategy (CSPs), Development partner strategy (DPs), and Outsourcing partner strategy (OPs). Within the primary chain of customer activities, the nature of the service offering and value creation is emphasized by the conceptualization of service strategies. Therefore, Gebauer, Edvardsson, Gustafsson, & Witell (2010) added the Customer-service provider strategy (CPs) to the beforementioned ones inter alia because of the consistency with related research of Davies (2004), Mathieu (2001), and Oliva & Kallenberg (2003).

Customer Service Strategy (CPs) - In general, the customer service strategy explores new business opportunities and augments the reputation by offering basic customer services that enhance customer interaction to the sales phase within the customer activity chain. This type of strategy affects overall customer satisfaction, strengthens the company's credibility and customer confidence. When implementing this strategy, services such as information services, delivery services, billing services and documentation need to be included (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010).

After-sales Service Strategy (ASPs) - Companies that implement the after-sales strategy provide customers with basic services such as spare parts, repairs, inspections and basic training to ensure that the product properly continues to function. Value creation from after-sales service providers is based on offering products and guaranteeing the proper functioning of the product (Gebauer, Edvardsson, Gustafsson, et al., 2010). The strategic goal is to respond as quickly as possible to any product breakdown and thus the focus of this strategy is to expand the market share of services, and safeguarding the current service business (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010; Raddats & Burton, 2011). After-sales service providers mainly focus on cost leadership. Very often price discounting is used as a source of competitive advantage because low prices cause deficits in product reliability that may lead to sporadic breakdowns (Gebauer, 2008).

Customer-support Service Strategy (CSPs) - The customer-support strategy's goal is to prevent any product breakdown. Advanced services, including, process optimization, training, preventive maintenance, and maintenance contracts are offered in order to achieve the company's strategic goal (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010). Customer-support service providers create a distinctive value proposition by investing in a strong product and service differentiation. By doing so, the providers intend to optimize the efficiency and effectiveness of the product. However, during the process of tailoring the service offering to meet the unique needs and preferences of individual customers, value is co-created with the customers. Within the business relationship, a new set of skills is created based on customer knowledge (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010; Oliva & Kallenberg, 2003). The price of the services is not integrated into the product price, because the services are bundled into customized packages, which are against a fixed price (Gebauer, 2008).

***Development Partner Strategy (DPs)* -** To achieve outstanding customer performance, development partners provide research and development services that concentrate on temporal expansion within the presales phase to support customers. By offering R&D-oriented services and coproduced competencies, development partners design and build products and systems from which the customers directly benefit. Another advantage of these competencies is that it makes it more difficult for competitors to catch up, because of the unique and difficult to imitate competence position development partners and their customers possess. Development partners use co-creation to learn about each other's capabilities. Following these learnings, customers are advised on how to design and construct their processes (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010). Development partners do not use price discounting and product imitations intensively to create competitive advantage (Gebauer, 2008).

***Outsourcing Partner Strategy (OPs)* -** Outsourcing partners combine product and service differentiation with cost leadership to offer attractive prices for operational services (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010). Outsourcing partners do not create customized service packages, because operational services are standardized and it is believed that customization is costly. These standardized operational services focus on efficiency and economies of scale. By co-creating an in-depth understanding of customer's operational requirements for process outputs value-in-exchange enables. As a result, the value-in-exchange is based on skills and knowledge of the operational process of the outsourcing partners' customers. However, without sufficient product and service quality, offering attractive prices for the execution of the outsourcing process is insufficient (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010).

2.1.4 Types of Offering

When implementing one of the abovementioned strategies, a certain type of services need to be included (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010). An important aspect of a servitization strategy is the value that the total offer delivers towards the customer (T. Baines & Lightfoot, 2013; T. S. Baines et al., 2009; Gebauer, Edvardsson, Gustafsson, et al., 2010). This offer may include a product, a product and services, or a product as a service. However, when a company moves through the servitization process, in terms of implementing a more advanced strategy, this will lead to a change in the offering. Table 1 sums up the abovementioned servitization strategies of Gebauer (2008) and Gebauer et al. (2010), including the corresponding types of offering and types of services (Gebauer et al., 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010). Moreover, when changing the offering, companies have to distinguish whether to compete on a defensive or offensive basis in order to exclude confusion and conflicts (Auguste et al., 2006; T. Baines & Lightfoot, 2013; Windahl, 2007).

Service Strategy	Types of Offering	Types of Services
Customer service strategy	Basic customer services that enhance customer interaction	Information services, Delivery services, Billing services and Documentation.
After-sales service strategy (Gebauer, 2008)	After-sales services to ensure that the product properly functions	Spare parts, Repairs, Inspections and Basic training
Customer-support service strategy	Product-related services to prevent any product breakdown. Often tailored offerings.	Advanced services like process optimization, training, preventive maintenance, and maintenance contracts
Development partner strategy	R&D-oriented services that concentrate on temporal expansion to support customers	R&D-oriented services and coproduced competencies to design and build products and systems.
Outsourcing partner strategy	Assume the operating risk and responsibility for the customer's operating process	Operational services that are standardized, focused on efficiency, and economies of scale

Table 1 Gebauer's service strategies (Gebauer, 2008; Gebauer, Edvardsson, Gustafsson, et al., 2010)

In literature, various authors defined different types of offerings. Mathieu (2001) distinguishes three types of contents in regard to services, namely Customer service, Product service, and 'Service as a product'. On contrary to Mathieu (2001), but similar to Gebauer's perspective, Davies (2004) suggests directions for moving towards offering high-value solutions that are directly linked to service offerings, namely integrating systems, providing operational services, offering business consulting. These services are connected with providing high-value integrated solutions, which include product and service components that meet the customer's needs. For this reason, integrated solutions are often customized and consist of different combinations. In addition, Ulaga & Reinartz (2011) examined key success factors for designing and delivering combinations of goods and services, in other words, hybrid offerings. According to Ulaga & Reinartz (2011), hybrid offerings create more customer benefits than when the product and service were available separately.

While Ulaga & Reinartz (2011) focused on hybrid offerings, Baines & Lightfoot (2013) took a more general approach to define service offerings and distinguish three types, namely base, intermediate, and advanced services. A company that wants to deliver advanced services goes through a transition from moving from base, through intermediate, to advanced services. During this transition companies expand their range of activities in order to take over customer's operational processes (T. Baines & Lightfoot, 2013). Base services relate to the simplest level of services. In the end base services are aimed at granting the customer access to the product. Examples of base services are spare part provision, product provision, and warranty services. With intermediate services, companies reassure that the provided equipment/product is properly maintained. The focus is on the maintenance and proper product condition. These intermediate services are based on base services. Examples of intermediate services are scheduled (technical) maintenance, overhaul and repair, installation, operational training, and a technical helpdesk.

Advanced services are more complex because the emphasis moves away from the product itself towards the performance of this product or service. Thus, the customer's result is the capability delivered by the performance of the product (Bustinza et al., 2015). These capabilities are frequently delivered through product-service systems. Advanced services are not only appealing because these services deliver a capability as an outcome, but also remove the need for product ownership. By delivering advanced services companies look at the extended lifecycle, the associated activities, and how to sustain this. By offering advanced services, a company takes over part of the risk and responsibility. The company takes great levels of responsibility that are related to the performance of the product, but also take responsibility that this performance is being fulfilled. This responsibility can be determined by the performance, availability, and reliability of the advanced service. Hence, when advanced services are offered companies will regularly refer to engaging the customer in a relationship that is associated with strategic repositioning and business process outsourcing. Examples of advanced services are customer support agreements, risk and reward sharing contracts, revenue-through-use contracts, and rental agreements (T. Baines & Lightfoot, 2013). Figure 5 illustrates the characteristics of advanced services (T. Baines & Lightfoot, 2013).

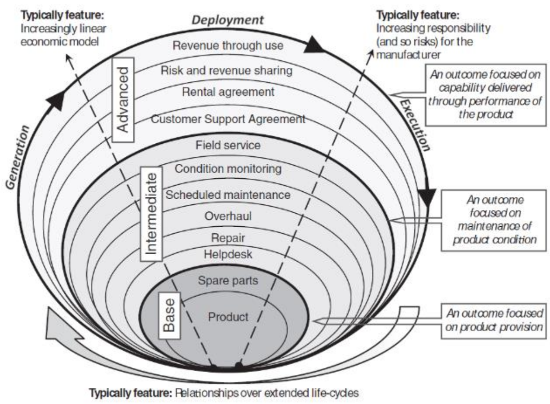

Figure 5 Characteristics of Advanced Services (T.Baines & Lightfoot, 2013)

2.1.5 Capabilities

In order to deliver advanced services, a company needs to develop or extend its capabilities. According to Raddats, Story, Burton, Zolkiewski and Baines (2014), eight broad capabilities are needed in order to provide and deliver advanced services, namely Customer-focused methodologies, Technical expertise, Developing a services culture, Network relationships, Service innovation, Customer intimacy, Services infrastructure, and Tailored and consistent service offerings. However, Story, Raddats, Burton, Zolkiewski and Baines (2017) identified six complementary and competing capabilities required for advanced services within a manufacturer's downstream network, which are subdivided into manufacturing, intermediary and customers perspectives. In addition, the study revealed that companies make use of their wider network. However, from a manufacturing perspective, the need to balance product and service innovation, developing customer-focused through-life service methodologies, and having a distinct, yet synergetic product and service cultures were identified. From the intermediary perspective coordination and integration of third party products and services capability is identified. Finally, from a customer's perspective co-creating innovation, and having process supporting service outsourcing are identified as unique and critical capabilities for advanced services.

In addition, Fliess & Lexutt (2019) identified service transition success factors, which are grouped into company-related factors, customer-related factors, and environmental factors. These success factors and their interrelationships have been visualized in the 'servitization house, see Figure 6 (Fliess & Lexutt, 2019). The starting point of the service transition is the assignment of the strategic importance of service offerings (Oliva & Kallenberg, 2003). For this reason, the integration of services into the corporate strategy is positioned at the top of the house. Since structure follows strategy, the columns of the house contain elements of organizational architecture that need to be adapted, namely business processes, organizational structure, organizational culture, and HRM (Chandler, 1962; Fliess & Lexutt, 2019; Mintzberg, 1990). In order to facilitate the required changes at the organizational and strategic levels resources, competencies and capabilities need to be employed first. Ultimately, these form the foundation of the 'servitization house'. In addition, the basis is strengthened and supported by the fact that partners and networks provide and share knowledge, resources and competencies in the field of service provision. Contingency factors have an impact on the performance of the servitization transition because these affect all elements of the 'servitization house' (Daft et al., 2014; Fliess & Lexutt, 2019; Robbins & Coulter, 2015). Examples of contingency factors are the location and size of the company. Competitive factors and developments in the macro-environment impact the service transition because of the fact that the company is embedded in its environment. Furthermore, to engage in mutual value creation, companies should align the servitization endeavour with the customer's needs and readiness (Fliess & Lexutt, 2019). All these factors might affect the organizational structure design in a direct or indirect manner. Therefore, we have to keep these factors and their interrelationships in mind when concluding the most viable organizational structure.

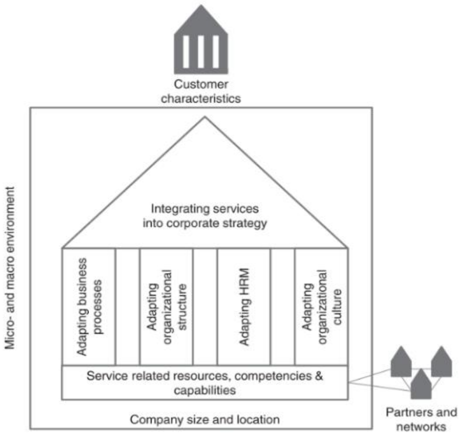

Figure 6 Servitization House (Fliess & Lexutt, 2019)

2.1.6 Challenges

Companies that adopt a servitization strategy have to keep in mind that its adoption presents not only structural challenges, but also challenges regarding strategy formulation, translation, measurement, translation of market demands, service design, capabilities, service-related processes and policies (Ahamed, Inohara, & Kamoshida, 2013; Alghisi & Saccani, 2015; T. Baines et al., 2009; Martinez et al., 2010). Furthermore, Shah et al. (2006) state that customer-centricity, an organization's customer focus provides a means to develop close and profitable relationships with customers companies, which is one of the drivers for servitization. In order to achieve customer-centricity, companies need to include the service strategy into a product-centred context, meaning companies have to balance both service- and product orientation (Salonen, 2011).

Moreover, Lay et al. (2010) found a positive relationship between the share of service revenue and a company's strategic commitment to services. A higher commitment to the service strategy will increase the number of resources being allocated to related initiatives. The emphasis on formulating and planning a deliberate service strategy helps in achieving a successful integration of services into the strategy (Oliva et al., 2012). Moreover, a systematic procedure to formulate strategy, covering all parts of the company affected by the service strategy, has a positive impact on the service revenue. Some suggest a rather incremental emerging strategy, while in practice most strategies consist of a combination of planned and emergent elements (Gebauer & Fleisch, 2007; Kohtamäki & Helo, 2015; Mintzberg, 1990; Neu & Brown, 2005). However, the strategy formulation and integration of servitization is only one of the challenges concerning servitization. According to the latest study of Raddats, Burton, Zolkiewski, and Story (2018) the servitization related challenges can be divided into four main categories, which includes structural reorganization.

The establishment of a service organization intensifies the service business and emphasizes strategic commitment (Gebauer et al., 2005; Kohtamäki & Helo, 2015). However, companies should reconsider and substantiate separation, because the disadvantages of separation may affect the optimal organizational design and outweigh the benefits (Raddats et al., 2018). However, the topic integration or separation of the service business unit is a well-discussed subject in literature (Fliess & Lexutt, 2019; Kowalkowski et al., 2011; Neu & Brown, 2005; Oliva et al., 2012; Oliva & Kallenberg, 2003). Nonetheless, there is still no consensus about this topic. Research has proven that the independent (separated) service organization has a positive impact on firm performance. In a separated service organization the service culture, commitment, service orientation, value and behaviour at all levels can be nurtured, strengthened, accelerated and grow continuously because the separation does not require unfreezing the existing behavioural patterns (Gebauer, Edvardsson, & Bjurko, 2010; Oliva et al., 2012; Oliva & Kallenberg, 2003). On the other hand, researchers argue that the service organization should be integrated into the organization, because it enables synergies and knowledge spillovers (Neu & Brown, 2005, 2008). Nevertheless, cross-functional communication, decentralized decision making, and information sharing are agreed on to be important aspects of integrating products and services (Antioco et al., 2008; Biggemann et al., 2013; Eggert et al., 2014; Kucza & Gebauer, 2011; Neu & Brown, 2008). However, due to the differences and the delay between the (non-)financial performance, there might be a temporal shift of priorities where the service organization initially is required to be isolated for setting the culture to be established but later requires integration to leverage capabilities and resources. Moreover, companies who offer new services need to choose between multiple configurations in order to deliver their services. For example, delivery via external partners, an in-house service organization, or a hybrid combination of both. In literature, it is argued how companies should manage their service business. For example, researchers state that the separate service business should be managed as an in-house organization, while making a distinction between front-end, customer-facing units and back-end, and product-and technology-facing units (Galbraith, 2002; Gebauer et al., 2005; Kowalkowski et al., 2011; Oliva & Kallenberg, 2003). Nevertheless, a certain misalignment between the organizational arrangement and the strategy may occur when core service activities are outsourced externally. It is common for basic, personnel-intensive services to be externalized, while knowledge-intensive services are likely to be performed in-house (Kowalkowski et al., 2011).

From a managerial service-oriented behavioural perspective separation is required because managers must fully control the targeting of customers and the development, pricing, and delivery of service offerings (Auguste et al., 2006). Furthermore, one of the required ingredients for a successful organizational change is managerial commitment. Hence, it is not clear to most managers how their efforts need to be organized in order to develop a successful service business and culture wherein values are centred on innovation, reducing resistance to change, and balancing efficiency and flexibility to create profits (Gebauer et al., 2005; Oliva et al., 2012). Antioco et al. (2008) identified six organizational parameters that guide managers during the establishment of the service climate. These parameters are top management's commitment to and visionary leadership of services, service rewards, service technology, cross-functional communication of service employees, service training, and customer treatment. During the organizing of service provision managers have to recognize key firm-, offering-, and market-specific factors in favour of each organizational arrangement, as well as the challenges of these factors. Managers responsible for the service provision must balance contradicting factors. Although it is quite a challenge for managers to have a complete overview of the market position, the service strategies, and the service portfolio, a clear picture of this is required in order to make such decisions (Kowalkowski et al., 2011). However, during the development of the service business employees need to behave as reliable troubleshooters, performance enablers and trusted advisors to successfully expand the service business (Neu & Brown, 2005). Therefore, managers and employees are challenged with a certain amount of responsibility towards the service provision and promotion (Fliess & Lexutt, 2019; Kowalkowski et al., 2011; Neu & Brown, 2008; Oliva & Kallenberg, 2003).

In order to develop the ability to promote and explain advanced service-intensive value propositions, companies should develop relationship building competences. These competences need to focus particularly on service sales and delivery and should include a focus on proactivity, continuity and the ability to capture specific customer needs (Kindström, 2010). In addition, companies need to create the capability related to the creation of a service delivery infrastructure that relates to the resource configuration. With this capability companies will have the ability to establish relationships with customers, capturing their needs and providing an efficient and effective interface with them. This is part of the development of new revenue mechanisms based on the customers' operations (Kindström, 2010). In order to derive long-term sustainable advantage from service provision, revenue mechanisms and overall profitability become more and more important. It can be stated that when a company knows more about its customers, it can make better and well-founded decisions in multiple business departments (Kindström, 2010; Windahl & Lakemond, 2006). Long-term relationships may provide companies with higher overall profitability, however, these relationships have to be developed and managed in order to unlock the full potential (Lindgreen, Palmer, Vanhamme, & Wouters, 2006; Martinez et al., 2010; Ulaga & Reinartz, 2011).

In short, we conclude that alignment between the organizational design, strategy, and conditions in the external environment is essential. With changing their organizational structure companies want to become more responsive to customer needs or try to expand into the service business (Gebauer & Kowalkowski, 2012). However, it is stated that adopting a new service strategy does not guarantee success. Therefore, in order to achieve success, a company is required to not only adapt its organizational structure to fit the market environment (Chandler, 1962; Gebauer, Edvardsson, Gustafsson, et al., 2010; Mintzberg, 1979b; Neu & Brown, 2005; Oliva & Kallenberg, 2003; Raddats & Burton, 2011). According to Daft et al. (2014), the ideal type of organization that fits the modern-day challenges is the 'learning organization'. In short, this organizational design is horizontally structured, follows a collaborative form of strategy, empowers employees, has a great sharing of information, and a culture that enables rapid adaptation of changing circumstances.

2.2 Organizational structures

Through time the opinions on what the best way to structure an organization were changed. During this research the following definition of organizations is used, namely; *"organizations are social entities that are goal-directed, are designed as deliberately structured and coordinated activity systems, and are linked to the external environment"* (Daft et al., 2014, p. 10). However, in order to find an appropriate definition of organizational structure that fits this research, the concept has been approached from different perspectives.

From a strategic perspective, Chandler (1962) noticed that changes in the organization's strategy led to administrative problems that required a new or refashioned structure. Therefore, Chandler (1962) defines organizational structure as the design of the organization through which strategy is administered. According to Mintzberg (1979b), who sees the organizational structure from a division like perspective, an organizational structure is; "*the sum of the ways in which an organization divides its labour into distinct tasks and then achieves coordination among them*" (Mintzberg, 1979b, p. 2). Later, Stacey (2007) included responsibility into the definition of organizational structure. As a result, Stacey (2007) defines organizational structure as; "*the formal way of identifying who is to take responsibility for what, who is to exercise authority over whom, and who is to be answerable to whom. The structure is a hierarchy of managers and is the source of authority, as well as the legitimacy of decisions and actions (Stacey, 2007, p. 57)*". However, the organizational structure can be considered as the viewing perspective through which individuals see their organization and its environment (Jacobides, 2007). Therefore, according to Jacobides (2007), the organizational structure affects organizational action and provides the foundation on which standard operating procedures and routines rest. It determines which individuals get to participate in which decision-making processes, and thus to what extent their view shape the organization's actions. Finally, according to Daft, Murphy and Willmott (2014), three key components define an organizational structure, namely an organizational structure (1) designates formal reporting relationships, including the number of levels in the hierarchy and the span of control of managers and supervisors. (2) It identifies the grouping together of individuals into departments and of departments into the total organization, and (3) it includes the design of systems to ensure effective communication, coordination and integration of efforts across departments. This definition determines where decision making and authority is located, takes into account the coordination of activities, and includes the relationship element (Daft et al., 2014). These are all elements that have been taken into account in the prior definitions and are noticed in the servitization literature (Galbraith, 2002; Mintzberg, 1979b; Stacey, 2007; Turunen, 2013). Thus, we conclude that the organizational structure, as described by Daft et al. (2014), is aimed at achieving to provide a framework of groupings, reporting relationships, and responsibilities. Second, it is aimed at providing mechanisms to link and coordinate organizational elements into a coherent whole, in order to achieve goals and to administer the strategy and link the external environment (Chandler, 1962; Daft et al., 2014; Jacobides, 2007; Stacey, 2007).

2.2.1 Organizational structure dimensions

In order to link and coordinate different organizational elements, most of the organizational structures are designed by multiple structural and contextual dimensions or key elements (Daft et al., 2014; Mintzberg, 1979a; Pugh, Hickson, Hinings, & Turner, 1968). Different elements or dimensions help companies to develop and design an organizational structure that fits their strategic goal. Next to the structural dimensions, who provide a basis for comparing organizational compositions, contextual dimensions, or contingency factors as Mintzberg (1979) calls them, characterize both the organization as a whole and the broader organizational setting. These dimensions may tell why the organization designed its structure as it does (Daft et al., 2014; Mintzberg, 1979b). However, to understand and evaluate organizations, it is of importance to examine and consider both structural and contextual dimensions, because of these dimensions influence and interact with each other (Daft et al., 2014). The structural dimensions and the contextual dimensions together provide a great basis for further measurement and analysis of organizational characteristics. For these reasons, the structural dimensions are dealt with first, after which the contextual dimensions are discussed in more depth.

2.2.2 Structural dimensions

Pugh, Hickson, Hinings and Turner (1968) defined six dimensions, namely: (1) Specialization, (2) Standardization, (3) Formalization, (4) Centralization, (5) Configuration, and (6) Flexibility. However, the first five dimensions of organization structure have been operationalized, because no adequate data was obtained on flexibility (Pugh et al., 1968). The first dimension, specialization, is concerned with the division of labour within an organization. A high degree of specialization enhances the performance of the sub-task, but at the same time complicates the integration of activities into the whole task (Galbraith, 2002; Pugh et al., 1968).

The second dimension is concerned with the standardization of procedures, while formalization indicates the extent to which rules, procedures, instructions, and communications are written. Centralization has to do with the level in the hierarchy where decisions that have an impact on the organization are being made. Final, configuration is the “shape” of the role structure. Configuration regards the vertical span of control and the chain of command. Furthermore, four underlying dimensions of organization structure have been established, namely structuring of activities, concentration of authority, line control of workflow, and relative size of supportive components (Pugh et al., 1968). Later, Mintzberg (1979) elaborates on the results of Pugh et al. (1968). Mintzberg (1979) states that there are nine different design parameters, which in turn can be subdivided into 'groups', see Table 2 Elements of organizational structure. In contrast to Pugh et al. (1968), Mintzberg (1979b) examined and described these parameters in more detail. For a more detailed explanation of each of these parameters see Appendix III (Mintzberg’s parameters).

Elements of organizational structure (Mintzberg, 1979b)	
Job Specialization	Design Position
Behaviour Formalization	
Training and Indoctrination	
Unit Grouping	Super structure
Unit Size	
Planning and Control Systems	Lateral linkages
Liaison Devices	
Vertical Decentralization	Decision-making
Horizontal Decentralization	

Table 2 Elements of Organizational structure (Mintzberg, 1979b)

In the literature, Mintzberg's design parameters are often used as a basis but are no longer treated in as much detail. In addition, fewer and more comprehensive parameters for organizational structures are often defined and researched. Auh and Menguc (2007) state that centralized companies are more efficient because these companies are engaged in streamlined information processing and decision making. On the other hand, a high level of customer focus, which is necessary to provide complex services, requires a decentralized organization, because such organizations are able to deal adequately with a variety of rich resources that are absorbed through their human capital (Auh & Menguc, 2007; Gebauer, Edvardsson, Gustafsson, et al., 2010).

According to Meijaard, Brand, Mosselman (2005) organizational structures are concerned with work division, that is the distribution of tasks and activities, and coordination mechanisms, which include standardization and formalization. Authors like Mintzberg (1979b) and Galbraith (2002) distinguish multiple types of structural dimensions and slightly define and agree on these dimensions. Nevertheless, specialization and decentralization regard the specificness of tasks and how authorities are distributed. In other words, both regard the division of work. On contrary, formalization, standardization and coordination are about controlling and optimizing procedures. Thus, regarding the coordination of mechanisms (Galbraith, 2002; Meijaard et al., 2005; Mintzberg, 1979b).

In line with this, Shahriari, Maleki, Koolivand and Meyvand (2013) mention that an organizational structure is a multi-dimensional structure which is related to the division of the organization, like (de)centralization and complexity, but also related to coordination, which includes standardization, formalization, or flexibility. In addition to these dimensions Robbins & Coulter (2015) add departmentalization, chain of command, and span of control to the before-mentioned dimensions of Shahriari et al. (2013). The dimension of departmentalization and span of control are in the basis similar to the definitions to Unit grouping and Unit size of Mintzberg (1979b). Robbins and Coulter (2015) define chain of command as 'the continuous line of authority that extends from the upper levels to the lowest level of an organization and clarifies who reports to whom. The chain of command is related to authority, unit of command and responsibility (Robbins & Coulter, 2015).

In addition, Daft, Murphy, and Willmott (2014) state that Hierarchy of Authority is one critical dimension of organizational structures. When looking at the definition of this dimension of Daft et al. (2014), it can be concluded that this dimension consists of the aforementioned dimensions span of control, chain of command, and configuration (Pugh et al., 1968; Robbins & Coulter, 2015). However, according to Daft et al. (2014), there are still two dimensions that the other authors have not yet mentioned, namely the dimensions professionalism and personnel ratios. In essence, the definition of professionalism is constructed on the Mintzberg's training and indoctrination definition, because professionalism is the level of formal education and training of employees. Nonetheless, personnel ratio refers to the deployment of people to various functions and departments. In order to measure the ratio of the number of employees in classification, this classification number needs to be divided by the total number of organizational employees (Daft et al., 2014).

As noticed, there is a lack of consensus about what the actual dimensions of organizational structures are. Multiple beforementioned dimensions describe to some extent the same thing but are defined differently. Therefore, Table 3 shows the dimensions and their definitions that we used in this research. The dimensions are mostly those as Daft et al. (2014) define, however, professionalism and personnel ratios have been left out because these dimensions cannot be filled in when the organizational design of a new department still needs to be established. In addition, responsibility is added because responsibility involves accountability, which is the need to report and justify the work. The accountability and responsibility do not only affect employee responsibility but also refers to business unit responsibility (Robbins & Coulter, 2015). For a general overview of the dimensions per author, see Appendix IV (Dimensions overview).

Structural Dimension	Definition
(De)Centralization.	Refers to the hierarchical level that has decision-making authority. When decision-making is kept at the highest level, the organization is centralized. When decisions are delegated to lower levels of the organization, it is decentralized (Daft et al., 2014; Mintzberg, 1979b; Robbins & Coulter, 2015).
Formalization.	The reliance on written documentation in the organization. This documentation covers procedures, job descriptions, regulations and policy manuals. In other words, to what extent are the rules, procedures, instructions and communication written and to which extend is the behaviour of employees guided by rules and procedures? (Daft et al., 2014; Robbins & Coulter, 2015)
Responsibilities.	Is defined as an authoritative position about having someone and the duty to make sure that certain things are done. It also refers to the way in which responsibilities within certain organizations and teams are divided and organized (Daft et al., 2014; Robbins & Coulter, 2015).
Departmentalization.	Is the way in which shared tasks are combined and assigned to working groups. Tasks can be combined in departments based on function, process, product or service, customer and geographical location (Mintzberg, 1979b; Robbins & Coulter, 2015).
Hierarchy (of Authority).	Describes who reports to whom and the span of control. This hierarchy is related to the span of control, the chain of command, and configuration (Daft et al., 2014; Mintzberg, 1979b; Pugh et al., 1968).
Specialization.	The extent to which organizational tasks are subdivided into individual functions. If the specialization is extended, each employee only performs a limited number of tasks (Daft et al., 2014; Galbraith, 2002; Mintzberg, 1979b; Pugh et al., 1968; Robbins & Coulter, 2015).

Table 3 Structural organizational dimensions

2.2.4 Contextual dimensions

Mintzberg (1979b) distinguishes four different types of contingency factors, namely Age and Size of the organization, Technical system, Environmental aspects (stability, complexity, diversity, and hostility), and Power of its relationships. However, these contingency factors form the basis for the contextual dimensions that Daft et al. (2014) describe in their later research. These contextual dimensions are Size, Organizational Technology, Environment, Goals and Strategy, and Culture.

The contextual dimension *size* is about the actual size of the organization and it can be measured for the organization as a whole or per department, plant, or division. Normally, size is measured by the number of employees. However, other measures like total sales reflect magnitude but do not indicate the size of the human part of the organization as a system. The second contextual dimension, *organization technology*, refers to the tools, techniques and actions used to transform inputs into outputs. It is about how organizations produce their products and services. Subjects related to organizational technologies include things like flexible production, advanced information systems and the internet. The *environment* dimension includes all elements and aspects, like stability, complexity, diversity, and hostility, who are outside the boundary of the organization. Moreover, other key elements outside of the organization's boundary are the industry, government, customers, suppliers and the financial community. What is taken into account is that an organization is often the most affected by competitors or other organizations. The *goals and strategy* dimension determines the purpose and competitive techniques that distinguishes organizations from other organizations. Goals and strategies outline the scope and relationship with employees, customers and competitors. A goal is often an enduring statement of the company's intent, while the strategy is the plan of action that describes resource allocation and activities for dealing with the environmental dimension. Most importantly, the strategy is the company's plan to reach the defined goals. Finally, the *culture* is the underlying set of key values, beliefs, norms and understandings shared by the employees of an organization, plant, or division. The underlying values can relate to ethical behaviour, employee engagement, efficiency or customer service, and are often the glue to keep the employees of the organization together. Moreover, the organization's culture is unwritten. However, the culture is reflected in the organization's stories, slogans, ceremonies, clothing and office design (Daft et al., 2014).

2.2.5 Organizational structure configuration

The beforementioned structural and contextual dimensions help to design an organizational structure that fits the organization and its surrounding. Successful companies design their structure to match their situation. However, organizations can be differentiated along three basic dimensions, namely (1) the key part of the organization that determines its success or failure, (2) the prime coordinating mechanism that is used to coordinate activities, and (3) the type of decentralization that is used (Lunenburg, 2012; Mintzberg, 1979b, 1992, 2007). The key parts of the organization, see Figure 7 (key parts), are:

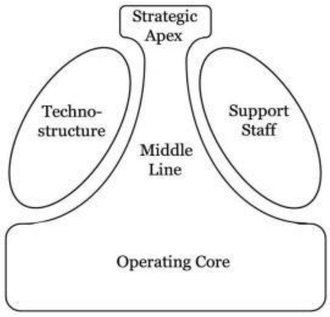

Figure 7 Key parts of the organization (Mintzberg, 1979b)

- Strategic apex: the top management and its support staff.
- Operative core: the workers who carry out the organization's tasks.
- Middle line: the middle- and lower-level management.
- Technostructure: analysts such as engineers, accountants, planners, researchers and personnel managers.
- Support staff: the people who provide indirect services

The second dimension, the coordinating mechanism, includes the supervision, standardization of skills, output, and work processes, and finally mutual adjustment. At last, the third dimension focusses on the beforementioned types of decentralization (Lunenburg, 2012; Mintzberg, 1979b, 1992, 2007). However, taken into account these three dimensions, Mintzberg suggests that the adoption of a specific strategy by organizations, and the extent to which the organization practices this strategy, results in the following structural archetypes; *the simple structure*, *the machine bureaucracy*, *the professional bureaucracy, the divisionalized form, and the adhocracy*. Mintzberg (1979b) argues that each company is dominated by one of the archetypes. Each of these archetypes is discussed and shown in Appendix V (Mintzberg's Archetypes). In the end, organizational structures fall on a spectrum with two extremes, that ranges from 'mechanistic' towards 'organic'. Mechanistic structures are also called bureaucratic. In short, mechanistic organization are characterized by its rigid and tightly controlled design. On contrary, an organic organization is characterized by its highly flexible and adaptive design. For more characteristics of both mechanistic and organic organizational designs see Table 4 (Daft et al., 2014; Lam, 2010; Robbins & Coulter, 2015).

Mechanistic Organization	Organic Organization
High specialization	Cross-functional teams
Rigid departmentalization	Cross-hierarchical teams
A clear chain of command	Free flow of information
Narrow spans of control	Wide spans of control
Centralization	Decentralization
High formalization	Low formalization

Table 4 Mechanistic vs. Organic organization

2.2.6 Organizational structure effectiveness

There are many possibilities how a company can structure their organization. However, after structuring the organization, it still is debatable if an organizational structure is effective. One approach to measuring the effectiveness of an organization is by the internal process approach, which measures the internal organizational health and efficiency. According to Daft et al. (2014) an effective organization, in the terms of the internal process approach, is an organization with a smooth, well-oiled internal process wherein employees are focused and satisfied, and the department's activities are coordinated to ensure high productivity. Based on a study of nearly 200 organizations seven indicators of an effective organization have been distinguished, see Table 5. Unfortunately, the internal process approach pays little attention to the external environment. Therefore, the total organizational output and the organization's relationship with the environment is not evaluated (Cunningham, 1977; Daft et al., 2014).

Indicators of an effective organization (Cunningham, 1977)
1. Strong corporate culture and positive work climate
2. Team spirit, group loyalty and teamwork
3. Confidence, trust and communication between workers and management
4. Decision making near sources of information, regardless of where those sources are on the organizational chart.
5. Undistorted horizontal and vertical communication; sharing of relevant facts and feelings
6. Rewards to managers for performance, growth and development of subordinates, and for creation of cooperative work groups.
7. Interaction between all parts of the organization, with conflict that occurs over projects being resolved in ways that are collectively beneficial and productive.

Table 5 Indicators of an effective organization (Cunningham, 1977)

In order to determine whether the organizational structure is still appropriate to the changing (external) conditions and aspirations of the organization, top executives have to evaluate the structure. In many cases, organizations try one of Mintzberg's structures and tweak this structure in an effort to develop a better fit between the organizational aspirations, and the internal and external environment (Cunningham, 1977; Daft et al., 2014; Mintzberg, 1992). The internal environment of an organization is defined by a company's resources, processes and culture which defines employee behaviour, while the external environment includes elements outside the boundary of the organization that have the potential to affect the organization (Daft et al., 2014; Moore, 1991; Robbins & Coulter, 2015). According to Daft et al. (2014), there are four symptomatic structural deficiencies, namely:

1. Decision making is delayed or lacking in quality.
2. The organization does not respond innovatively to a changing environment.
3. Employee performance declines and goals are not being met.
4. Too much conflict is evident.

There are several reasons why these deficiencies may pop up in the organization. One reason for the delayed decision making can be that the hierarchy funnels too many problems and decisions to certain employees in the organizational structure (Cunningham, 1977; Daft et al., 2014; Galbraith, 2002; Mintzberg, 1992). A lack of coordination could be the reason for the lack of innovative response to the changing external environment. Unclear goal, responsibility and coordinating mechanisms can be the reason for the decline in employee performance. There is no basic reasoning for these four deficiencies (Daft et al., 2014; Galbraith, 2002; Mintzberg, 1992). Therefore, research has to be conducted by the management in order to come up with well-founded adjustments that remedy these deficiencies (Daft et al., 2014).

2.3 Theoretical Framework

Based on the above literature review, we conclude that there is a growing body of literature that recognizes the organizational structure as one of the challenges to overcome, in order to succeed with servitization. It is of importance that when a company implements servitization as a strategy that the strategy fits the internal- and external environment of the organization (Fliess & Lexutt, 2019; Kowalkowski, Kindström, & Witell, 2011; Neu & Brown, 2005, 2008; Raddats & Burton, 2011). However, the implementation of a service strategy in order to provide advanced services often results in a mismatch with organizational configuration factors. The mismatch is often caused due to the fact that firms implement a new service strategy, but do not redesign their organizational structure to create a fit between strategy, offering, and market-specific factors (Gebauer, Edvardsson, Gustafsson, & Witell, 2010; Kowalkowski et al., 2011).

It can be stated that organizational structures in servitization literature mainly have been discussed in terms of a strategy structure fit, and whether to integrate or separate the service business unit (Ahamed, Kamoshida, & Inohara, 2013; Gebauer, Friedli, & Fleisch, 2006; Raddats & Burton, 2011; Raddats, Kowalkowski, Benedettini, Burton, & Gebauer, 2019; Turunen & Finne, 2014). However, delivering product-service systems requires organizations to reconfigure themselves to meet customer needs (Bustinza, Bigdeli, Baines, & Elliot, 2015; Gebauer et al., 2010; Gebauer & Kowalkowski, 2012). Consequently, the organization requires restructuring to facilitate the delivery of product-service systems (Storbacka, 2011; Windahl & Lakemond, 2006). According to Baines et al. (2020), manufacturers undergo four stages of organizational maturity, in which the organization develops through, among other things, organizational readiness and organizational involvement. Moreover, Baines et al. (2020) conclude that servitization can be seen as both a transition, in which companies move from products to services, and a transformation, suggesting that servitization is more of a shift where earlier stages are embraced and built upon. On this basis we assume that there is a possible link between the degree of servitization and a viable organizational structure to offer product-service systems.

Nonetheless, after analysis of the literature review we concluded that the dimensional aspects of organizational structures have not yet been explored in servitization literature. The structural organizational dimensions are part of an organization's internal environment. However, the other parts of the internal environment in combination with influences from the external environment partly determine how the organizational structure should be designed to achieve success. Thus, when designing an organizational structure these elements have to be kept in consideration. However, when looking at the researched topics and their interrelationships, the relationship between the degree of servitization, the characteristics of organizational structures and servitization success has not been sufficiently researched. To be more specific, from the perspective of structural organizational dimensions and contextual factors. Based on the research question in combination with the theory, this research will only focus on the organizational structure dimensions of (de)centralization, departmentalization, formalization, hierarchy of authority, responsibilities, and specialization. Furthermore, in order to obtain the best possible picture of the organizational structure design and the performance of a servitizing organization, the following contextual moderating variables have been derived from the literature and have been included in this research, namely (cross-functional) communication, commitment (managerial/employee), culture, flexibility, infrastructure, and synergies. All these contextual factors are derived from the literature review and do not directly relate to the structural organizational dimensions. However, managers may take these constructs into account during the design of an organizational structure to ensure and maximize the potential benefits of each one of them.

At first, culture is one of the contextual dimensions and part of the internal environment of the organization. The culture of an organization helps to define employee behaviour (Daft, Murphy, & Willmott, 2014; Moore, 1991; Robbins & Coulter, 2015). Second, managerial and employee commitment are required ingredients for a successful organizational change. To enable commitment, motivation deriving from understanding the benefits as well as the results of the service business is required (Gebauer et al., 2005; Oliva et al., 2012). Third, (cross-functional) communication is agreed on to be one of the important aspects of integrating products and services (Antioco et al., 2008; Biggemann et al., 2013; Eggert et al., 2014; Kucza & Gebauer, 2011; Neu & Brown, 2008). Fourth, flexibility is of the dimensions of organizational structure and relates to the coordination of companies with the environment (Pugh et al., 1968; Shahriari et al., 2013). One of the challenges regarding the establishment and delivery of advanced process-centred services is building a service infrastructure (Gebauer et al., 2005; Raddats et al., 2014). A service infrastructure will help companies to establish relationships with customers, define their needs and provide them with an efficient and effective interface (Kindström, 2010; Story et al., 2017). Finally, according to Fliess and Lexutt (2019), synergies are vital for the service transition. Moreover, Neu and Brown (2005, 2008) state that synergies between products and services are developed through greater knowledge and resource spillover, increasing customer loyalty and cooperation, and the leverage gained from intangible assets. For a visualization of this theoretical framework, see Figure 8 (conceptual model). For more detailed insights about the relationship of the contextual factors and the organizational dimensions see chapter 3.5 Assessed constructs.

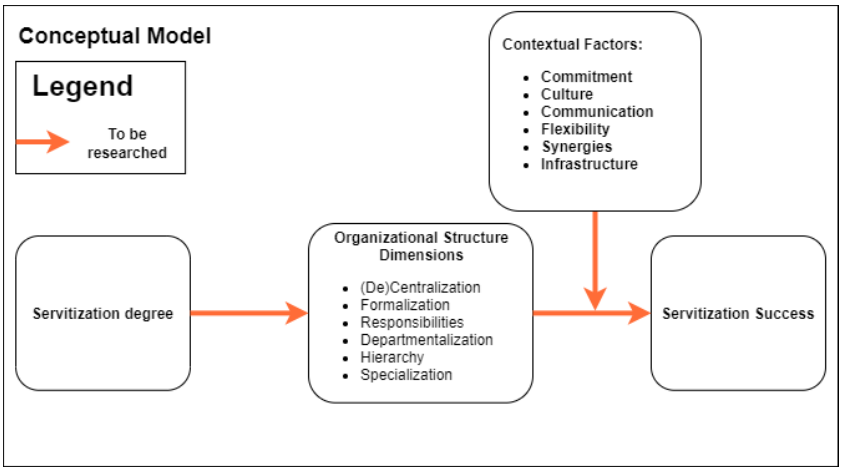

Figure 8 Conceptual model

3.0 Methodology
The aim of this research is to combine theoretical and empirical knowledge in order to make a well-founded recommendation regarding a viable organizational structure. From a holistic approach, this research is used as guidance during the overall transition that organizations/departments will experience in order to offer product-service systems. Thus, it is of importance to get a clear in-depth understanding of the success factors and structural organizational dimensions, which ensure that the product-service systems can be offered as a service. This chapter will give insight into the methodology that has been used to answer the following research question:

"What is a viable organizational structure to offer a product-service system?"

At first, the research design is introduced, followed by the case company introduction. Subsequently, the research setting, data collection methods and data analysis are discussed.

3.1 Research Design
In order to gain in-depth understandings of the complex context, a qualitative research design has been adopted (Bryman & Bell, 2015; Tracy, 2013). After analysis of the scope, the boundaries and the research setting, it has been concluded that the internal multiple case study research strategy was the best fit for the aforementioned aspects (Tracy, 2013; Yin, 2017). According to Yin (2017), case studies are used in many situations to contribute to the knowledge of individual, group, organization, social, political and related phenomena. Case studies allow researchers to retain the holistic and meaningful characteristics of real-life events, such as organizational and managerial processes. A case study is a research strategy that investigates a phenomenon in-depth within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident (Yin, 2017, p. 15). In short, a case study is a descriptive and exploratory analysis. Case studies can be single or multiple and include qualitative and quantitative evidence, rely on multiple sources of evidence and benefits from the development of theoretical propositions (Bryman & Bell, 2015; Yin, 2017). Therefore, this research, with its exploratory character, entails in-depth multiple case studies and uses both qualitative and quantitative data to explore *in what way* and *to what extent* an organizational structure needs to encompass to deliver product-service offerings as a service. Servitization and suitable organizational structure to offer product-service systems is a not extensively and contemporary researched phenomenon. Within the scientific field, a multiple case study research design is a common method to study servitization and organizational structures (Bustinza, Bigdeli, Baines, & Elliot, 2015; Kowalkowski, Kindström, & Witell, 2011; Neu & Brown, 2005; Oliva, Gebauer, & Brann, 2012; Oliva & Kallenberg, 2003). Thus, a multiple case study forms a suitable method to develop an integrated view within this exploratory research (Yin, 2017). The prior essential step to execute multiple case studies is the development of theoretical propositions. This is addressed by the literature review, which resulted in a theoretical framework and forms the basis of the conceptual model, see Figure 8 (conceptual model) (Bryman & Bell, 2015; Yin, 2017).

3.1.1 Theoretical background
Literature is used to substantiate the problem, background and the potential value of a solution. Theoretical exploration of the related topics is carried out on the basis of a literature review, which ensures that the related important variables of the associated research topic are recognized. In the context of this research, literature from various research fields is examined because of the multidisciplinary nature of the subject (Bryman & Bell, 2015; Yin, 2017). As a result, the literature review contains literature from the fields of servitization, organizational design, and organizational structures (Bryman & Bell, 2015; Yin, 2017). Most of the related literature is obtained on the basis of the snowball effect (Krackhardt & Porter, 1986). Within the literature found, we looked for relevant search terms and authors that are often quoted. These findings, in turn, are examined for useful information. The most important outcomes of the literature review are the structural dimensions and contextual factors that are addressed during the analysis. Together the structural dimensions and contextual factors form the constructs of this research. The following definition of a

construct is used, namely; *"a construct is the abstract idea, underlying theme, or subject matter that one wishes to measure"* (Lavrakas, 2008). During the analysis, the constructs that impact the organizational structure are measured through different data collection methods. Subsequently, the collected data is organized and linked using multiple methods and analysed. The organizational structure dimensions and definitions form the basis of the analysis. Finally, the outcomes of the analysis are used to make a well-founded recommendation regarding the viability of an organizational structure to offer product-service systems.

3.2 Case study company

In 2017, the management of Company-X identified three trends that are gaining more strength in the individual markets served by the diverse business units. The first trend focusses on the fact that there is a certain shift in which phase of the overall process the most value is created. The second trend focusses on the fact that software has become increasingly decisive for the functioning of the offerings. At last, the third trend focusses on the transition of the distribution channels. As a result of these trends, Company-X decided to steadily reduce its production activities and started to invest in expanding the development capacity. Overall, the investments of Company-X are aimed at generating powerful propositions to move markets, whereby the customer contact intensification results in deeper market and customer insights. These insights form the basis of new software-based propositions that generate recurring revenues, whereby dynamic networks of companies ensure the correct functioning of the offerings. For a more detailed explanation of the trends, see Appendix VI (trend explanation).

3.3 Research Setting

Company-X consists of several business units which, due to the company's strategic course, are engaged in generating a higher degree of recurring revenues, and sustaining growth while taking specific customer- and market needs into consideration. However, each business unit can be seen as a separate company under the roof of Company-X because the business units themselves are responsible for their own strategic course, marketing, products and services, and after-sales. Moreover, none of the business units is active in the same market or market segment.

As a result of the strategic course, types of offering and types of services the business units can be divided by the degree of servitization into non-, semi- and fully servitized groups. This offered the opportunity to gain insights and learnings in how these business units have set up the organizational structure during the different phases of the servitization process. Since it was possible to distinguish between the various business units, it was possible to gain insights and learnings into how these business units have designed the organizational structure and what reasoning lies hidden behind their current structures and success. For example, which factors are considered to be the most important in order, for a change in the organizational structure, to succeed. When looking more closely at the setting in which this research took place, it must be concluded that BEAT is an independent research group who shares the corporate identity of Company-X. Therefore, we concluded that within Company-X there are factors that apply to the entire company. Examples of these factors are Company-X's corporate strategy, corporate culture, and overall branding.

Due to the fact that the business units each operate in a different market and have their own responsibilities, the findings can be seen as context specific. This makes it possible to compare findings from different contexts, which ultimately contributes to the external validity and generalizability. From a practical perspective, an internal multiple case study was the only option because of the confidentiality regarding the company and the subjects of interest, like strategy and organizational structure that results in certain competitive advantages. Therefore, it was chosen to do multiple case studies within Company-X to gather the data.

3.4 Case study descriptions.

Within this research it was chosen to investigate multiple cases within Company-X at the different business units. Therefore, the following paragraphs contain brief explanations of the different business unit cases. Each explanation contains information about the business unit's strategy, mission, propositions, services and the market in which the business unit operates.

3.4.1 Case Business unit-I

3.4.2 Case Business unit-Y

3.4.3 Case Business unit-L

3.4.4 Case Business unit-R

3.4.5 Case Business unit-C

3.4.6 Case Business unit-S

3.4.7 Case Business unit-H

3.4.8 Background BEAT

Over the years, Business unit-Y who is active in the security market noticed that the mismatch between customer needs and the current offering has developed into a problematic form. After investigating the reasoning behind the mismatch Business unit-Y concluded that the digitalization of the world and the maturing of certain technologies created a shift in the customers' needs. In the past customers wanted to own the solution, while nowadays customers are more interested in paying for a solution instead of owning it. The current business model of Business unit-Y creates a large distance to the market. As a result, Business unit-Y could not facilitate the customers in their needs, because of a lack of information and feedback that is needed to correctly respond to the customers' needs and problems. The lack of information and feedback fuelled the frustration among customers and Business unit-Y. In addition, the management of Company-X shifted its focus towards high-end customers and revenue predictability. As a result, business units are redesigning their propositions.

With the redesigning of the propositions Company-X, and especially Business unit-Y, looked critically at ways to reduce the mismatch. Business unit-Y decided to create and isolate a 'spin-off' research group, named BEAT, that is challenged to overcome the aforementioned challenges. One of the most impacting challenges is the transition from product-based business models towards service-based business models. Within Company-X there are several business units who can be considered servitized because these business units only offer (product-)service offerings via a subscription model. On contrary, other business units who do not offer products, product-service systems or services via a subscription model can be seen as semi- or non-servitized. BEAT is concerned with reinventing the way Product-X systems are offered and by starting from scratch, BEAT will not experience any transition. As a starting point BEAT wants to develop a cloud-based Product-X system that is build-up via a top-down approach. This system will be designed and built to tackle the challenges and threats of the future. Additionally, a cloud-based system requires characteristics such as scalability, compliance by design, the lowest possible downtime, and easy manageability (Ahmad, Morelli, Ranise, & Zannone, 2018; Gartner, 2014; Varadharajan & Tupakula, 2014).

Eventually, BEAT wants to offer this new system on a subscription basis. However, the subscription-based model is still in development and there is still a lot to change in terms of the way it will be offered. All these changes will not only affect the offering but will affect the way in which processes are designed, managed and organized. In order to fully function, what has to be kept in mind, is that hardware is still essential for this cloud-based system offering. The hardware and software can be sold together as a product (hardware) with associated services (software). However, this might change in the near future. One of the things that have to be designed and aligned in order to contribute to the overall success of this cloud-based system is the organizational structure. From the launch of the offering, BEAT wants to have the entire structure in place to be able to deliver the offering as a service. This organizational structure needs to facilitate the market needs, customer needs and the corporate strategy. Furthermore, the structure needs to be designed to diminish the knowledge gap, and to eliminate the frustration and mismatch. During the time of this research, BEAT is beyond the conceptual phase. For this reason, strict rules apply regarding confidentiality and non-disclosure. For more detailed insights in the process and identification behind the reasoning of the establishment of BEAT, see Appendices VII (Beat establishment).

3.5 Assessed Constructs

During the case study, an applied research-based approach is chosen wherein knowledge, theories, methods and techniques are brought together in order to research the specific situations within Company-X at the different business units. During the data collection, multiple constructs have been used to gather data about the structural organizational dimensions. However, to avoid confusion the constructs that have been derived from the literature review are operationalized, see Table 6 (Operationalization).

Structural Dimension	Operationalization
(De)Centralization.	Refers to the hierarchical level that has decision-making authority. When decision-making is kept at the highest level, the organization is centralized. When decisions are delegated to lower levels of the organization, it is decentralized (Daft, Murphy, & Willmott, 2014; Mintzberg, 1979; Robbins & Coulter, 2015).
Formalization.	The reliance on written documentation in the organization. This documentation covers procedures, job descriptions, regulations and policy manuals. In other words, to what extent are the rules, procedures, instructions and communication written and to which extend is the behaviour of employees guided by rules and procedures? (Daft et al., 2014; Robbins & Coulter, 2015)
Responsibilities.	Is defined as an authoritative position about having someone and the duty to make sure that certain things are done. It also refers to the way in which responsibilities within certain organizations and teams are divided and organized (Daft et al., 2014; Robbins & Coulter, 2015).
Departmentalization.	Is the way in which shared tasks are combined and assigned to working groups. Tasks can be combined in departments based on function, process, product or service, customer and geographical location (Mintzberg, 1979; Robbins & Coulter, 2015).
Hierarchy (of Authority).	Describes who reports to whom and the span of control. This hierarchy is related to the span of control, the chain of command, and configuration (Daft et al., 2014; Mintzberg, 1979; Pugh, Hickson, Hinings, & Turner, 1968).
Specialization.	The extent to which organizational tasks are subdivided into individual functions. If the specialization is extended, each employee only performs a limited number of tasks (Daft et al., 2014; Galbraith, 2002; Mintzberg, 1979; Pugh et al., 1968; Robbins & Coulter, 2015).

Table 6 Structural dimension operationalization

Besides the structural dimensions, multiple contextual constructs have been operationalized. The related operationalized constructs are Culture, Commitment, Communication, Flexibility, Infrastructure and Synergies. Each of these constructs and their relation to success is slightly elaborated.

Culture - Culture is one of the contextual dimension and is part of the internal environment. The culture of an organization helps to define employee behaviour (Daft et al., 2014; Moore, 1991; Robbins & Coulter, 2015). Furthermore, service culture is part of the organizational architecture and is seen as one of the necessary servitization capabilities for organizations in order to successfully servitize (Fliess & Lexutt, 2019; Story, Raddats, Burton, Zolkiewski, & Baines, 2017). Moreover, a service-oriented culture, wherein values are centred on innovation, reducing resistance to change, and balancing efficiency and flexibility, helps to create profits and enables rapid adaptation of changing circumstances (Daft et al., 2014; Gebauer, Fleisch, & Friedli, 2005; Oliva et al., 2012).

Commitment - Managerial and employee commitment are required ingredients for a successful organizational change. To enable commitment, motivation deriving from understanding the benefits as well as the results of the service business is required (Gebauer et al., 2005; Oliva et al., 2012). Moreover, Lay et al. (2010) found a positive relationship between the share of service revenue and a company's strategic commitment to services. The higher the strategic commitment, the higher the number of resources being allocated to related initiatives will be (Lay et al., 2010).

Communication - (Cross-functional) Communication is agreed on to be one of the important aspects of integrating products and services (Antioco, Moenaert, Lindgreen, & Wetzels, 2008; Biggemann, Kowalkowski, Maley, & Brege, 2013; Eggert, Thiesbrummel, & Deutscher, 2014; Kucza & Gebauer, 2011; Neu & Brown, 2008). Daft et al. (2014) state that effective communication systems are one of the components that defines organizational structures, whereby organizational structures include systems to ensure effective communication, coordination and integration efforts across departments. In addition, Shah et al. (2006) state that intense communication helps to overcome inevitable barriers during cultural behavioural change. Furthermore, (cross-functional) communication is linked to the effectiveness of new product and service development, product quality, product innovation capacity, and the ability to deal with complex and dynamic environments. Moreover, communication between functions promotes collective learning and the efforts needed to achieve common goals (Antioco et al., 2008).

Flexibility - Flexibility is of the dimensions of organizational structure and relates to the coordination of companies with the environment (Pugh et al., 1968; Shahriari, Maleki, Koolivand, & Meyvand, 2013). To be more specific, flexibility is related to profit creation, service-oriented values, relationship building, resource allocation, cultural change and coordination (Auguste, Harmon, & Pandit, 2006; Fang, Palmatier, & Steenkamp, 2008; Gebauer et al., 2005; Gebauer & Kowalkowski, 2012; Oliva et al., 2012). In other words, flexibility refers to the degree of modularity if necessary, allowing variations as requirements change (Raddats, Story, Burton, Zolkiewski, & Baines, 2014; Story et al., 2017).

Infrastructure - Nevertheless, building a service infrastructure is one of the challenges regarding the establishment and delivery of advanced process-centred services (Gebauer et al., 2005; Raddats et al., 2014). When companies have a service infrastructure, companies will have the ability to establish relationships with customers, define their needs and provide them with an efficient and effective interface (Kindström, 2010; Story et al., 2017).

Synergies - At last, there is no exact conceptualization or definition of synergies in a servitization context. As a result, we use the definition of synergy from the Cambridge dictionary as our operationalisation. According to Fliess and Lexutt (2019) synergies are vital for the service transition. In addition, Neu and Brown (2005, 2008) state that synergies between products and services are developed through greater knowledge and resource spillover, increasing customer loyalty and cooperation, and the leverage gained from intangible assets. According to Fang et al. (2008), the integration of the service business stimulates synergies and spillovers.

All these constructs are derived from the literature review and do not directly relate to the servitization degree or the structural organizational dimensions. However, managers may take these constructs into account during the design of an organizational structure to ensure and maximise the potential benefits of each one of them. In addition, by adding these constructs, managers could provide a better, in-depth description of the servitization degree, the current organizational structure and the rationale behind this structure. For these reasons, it was decided to add these constructs to the current structural organizational dimensions. For an overview of the operationalizations, see Table 7.

Construct	Operationalization
Culture	The underlying set of key values, beliefs, norms and understandings shared by the employees of an organization, plant or division (Daft et al., 2014; Robbins & Coulter, 2015).
Commitment (employee/managerial)	Refers to the motivation arising from understanding the benefits and seeing the outcomes of implementing the change (Gebauer et al., 2005; Oliva et al., 2012).
(Cross-functional) Communication	cross-functional communication is one of the six organizational parameters and refers to the interdependency and information sharing between various organizational units (Antioco et al., 2008).
Flexibility	Refers to the degree of modularity if necessary, allowing variations as requirements change (Raddats et al., 2014; Story et al., 2017).
Infrastructure	Related to all provisions who relate to the ability to establish relationships with customers, capturing their needs and providing an efficient and effective interface (Kindström, 2010; Story et al., 2017).
Synergies	When the combined power of a group of things, when working together, is greater than the total power achieved by each working separately (Cambridge University Press, 2020).

Table 7 Construct operationalization

3.6 Data Collection Methods

Within this research, data has been collected in several quantitative as well as qualitative ways. These data collection methods and the reasoning for the use of these methods will be explained in this chapter. First of all, the reasoning behind the participants will be explained, after which the reasoning behind the use of both quantitative and qualitative data collection methods will be explained.

3.6.1 Participants

In order to get a clear insight into the organizational design and performances of all business units, the managing directors have been chosen as participants of this research. Moreover, these managing directors have the experience, knowledge and are ultimately responsible for the subjects related to this research. If for any reason, these managing directors were unable or unwilling to take part in this research, a suitable candidate has been sought within their current business unit. For an overview of the respondents, see Table 8 (respondents overview). In addition, due to the confidential matter of the research, it is chosen to only select internal respondents. For privacy and confidentiality reasons, fictive names and abbreviations are used for the interviewees and business unit names.

Participant Name	Job title
Respondent-R	Managing Director Business unit-R
Respondent-L	Managing Director Business unit-L
Respondent-H	Managing Director Business unit-H
Respondent-C	Managing Director Business unit-C
Respondent-S	Managing Director Business unit-S
Respondent-I	Managing Director Business unit-I
Respondent-Y	Managing Director Business unit-Y

Table 8 Respondents overview

3.6.2 Tools

Deriving from literature Fliess and Lexutt (2019) state that the appropriate organizational structure depends on the maturity of the servitization process. However, there does not yet appear to be a suitable tool to determine the 'maturity' of the servitization process. As a result, alternative methods and techniques have been explored to distinguish between the servitization degrees of the business units of Company-X.

Manufacturers undergo four stages of organizational maturity. As a result, an organization develops according to the pressure of five main forces, including organizational readiness and organizational involvement (Baines et al., 2020). Due to the fact that several constructs will be treated during this research, but that there is limited time, we looked for ways to gain insight into the servitization degree, organizational readiness and involvement, and constructs related to servitization. Simultaneously, these tools had to ensure that the position of the business units concerning the servitization process could be determined, in order to look at possible relationships between the degree of servitization and the importance of certain constructs. In addition, these tools had to generate insight to check if statements about key success related constructs matched the given interview responses. We did this by searching for specific tools to make constructs quantifiable so that the results could be compared with each other. Furthermore, these tools ensured that the respondents gained insight into the current organization and were stimulated to start thinking about the current way of business unit design and the performance linked to it prior to the interview. When each respondent filled in the tools, an average was made for Company-X. Based on this average, it was checked whether there is a link between the scores and the interview results. In this way, it was determined which contextual factors contribute to success, whether there is a link between the way of organizing and the respondents' statements and the success of the business unit.

After comparing multiple tools, the choice was made to use a combination of the 'servitization readiness' tool and the 'relationship management' tool to generate comparable insights between the business units of Company-X. Prior to the selection, multiple tools were compared based on ease of use, aim and purpose. Chapter 3.10 Tool Comparison contains the tool comparison and more explicit argumentation why some tools were (not) chosen. However, in order to successfully servitize each company needs to possess servitization related capabilities. The servitization capacity/readiness tool aims to measure a departments capacity for servitization. The tool focuses on capabilities for service development, service deployment, and service orientation of corporate culture. The tool consists of 48 questions that relate to the three service-related factors. Each question is rated on a 7-point scale ranging from 0 (entirely disagree) to 7 (entirely agree). The results are grouped based on the capability that it addresses and is visualized in a radar diagram.

After companies are servitized, the overall attractiveness and the ability to lock in customers in a long-term relationship becomes more important (Baines & Lightfoot, 2013; Baines, Lightfoot, Benedettini, & Kay, 2009; Turunen, 2013). For these reasons, the second tool focusses on elements related to Relationship Management (RM). This tool is used for assessing and further improving the organization's relationship management elements. The tool focusses both on the long- and short-term relationships. Each element has 11 scale levels ranging from 0 to 10. Level 0 represents a minimum level and indicates an immature and non-sophisticated RM structure, while level 10 represents the maximum and indicates a mature and well-managed RM structure/program. The purpose of this RM tool is to help managers to identify, prioritize, question and make explicit critical aspects of customer relationships (transactional/relative). This makes it possible for managers to shift between different types of relationships. The main reason why we chose this tool is that it complements the servitization capacity tool. During the servitization process, (long term) customer relationships become more important to distinguish yourself from competitors. Relationship management focuses on adding value to goods and services and focuses on both long-term relationships and short-term transactions (Lindgreen et al., 2006). Furthermore, these results are also visualized in a radar diagram.

In summary, both tools do not only ensure that the participants are warmed up for this research, but also provide insights into the degree of servitization and performance of the business unit. The tools are mainly used to determine where each business unit stands in the servitization process, and to see if any difference can be seen based on the addressed capabilities and elements. Nevertheless, the generalized data does not create insights into how the structural organizational dimensions relate to servitization performance. However, the scores may substantiate specific structural decisions or success factors.

3.6.3 Semi-structured interviews

In order to get more in-depth insights into the way other business units have designed their organizational structure semi-structured interviews have been conducted. Semi-structured interviews allow the researcher to ask questions that go more in-depth into the topics and allows participants to reflect on their perspective (Bryman & Bell, 2015; Tracy, 2013; Yin, 2017). Moreover, semi-structured interviews contribute to ensuring the reliability and validity of the results (Bryman & Bell, 2015; Yin, 2017). To structure these interview an interview guide was created, referring to a list of questions and topics on a fairly specific topic (Bryman & Bell, 2015). The interview questions are derived from the literature study and are organized around three main topics, namely the business unit in general, the market, and the organizational structure. Moreover, the interviews identified reasons behind servitization, experienced difficulties, the offerings, and the role of services within the business unit. The aim was to relate the findings to the theoretical framework. However, at the same time, there had to be room for enriching insights. The interviews therefore included questions such as:

- 'Which factors are important for a change in the organizational structure to succeed?'
- 'Has something structurally changed during the servitization process concerning the organizational structure?'
- 'What was, from a personal perspective, the pitfalls during the servitization process regarding the organizational structure?'

In order to obtain more detailed information on key or related subjects, general questions were used from which follow-up questions were derived. Before the interview, the questions and construct definitions have been translated into Dutch in order to minimize any language barrier. This also applies to the explanation of the tools. Furthermore, the interviewees had the opportunity to draw in order to strengthen and visualize their answers. Eventually, seven interviews were carried out with a duration between 45 – 75 minutes each. Afterwards, each interview has been transcribed in Dutch. These transcriptions are used to substantiate the results and conclusion.

For practical reasons, the constructs have been used to describe the organizational structure per business unit. The constructs have been merged on the basis of their definition and interrelationships. An example of the merging method is the construct Hierarchy of Authority defined by Daft et al. (2014). This construct includes the aforementioned dimensions of span of control, chain of command, and configuration that have been defined by Pugh et al. (1968) and Robbins & Coulter (2015). Therefore, these constructs were merged into Hierarchy of Authority. Based on this method, the constructs were analyzed and if possible merged. Appendix VIII (interview schemes) includes an overview of the interview guide, the translated constructs, and the tools that have been filled in by the participants.

The combination of tools and interviews ensures that a good understanding is generated regarding the design of the organizational structure and related factors for success. The tool results ensure that an initial screening can be made of factors that are important and should therefore theoretically score higher. Because the tool has to be filled in prior to the interview, the respondents can already consider whether there are certain factors or elements that influence success but have not been taken into account during this research. During the interviews, there was room to discuss this and to find out what the reasoning behind this is. On the basis of the descriptions of the structural dimensions and the reasoning behind the tool results, it can be determined in what way a dimension should be set up in order to be viable.

3.7 Ethics

Following an application for approval, the University of Twente's Ethical Committee approved the manner in which this research has been carried out. As such, this research complies with all the ethical standards set by the University of Twente with regard to external qualitative research. In the appendix to the invitation to the interview, the interview questions to be asked were made available to the participants. This invitation also contained an explanation of how the data collection process was structured. The participants were free to refuse participation in this research. At the beginning of every interview, permissions to record and participation in this research were asked. The collected data has been treated as confidential. As a result of the confidentiality, the results have been anonymized or removed from the public version of this research.

3.8 Data Analysis

The interviews have been recorded digitally and transcribed. The results of the tools have been digitized and incorporated into radar diagrams. These radar diagrams, in combination with the case descriptions, make it possible to place the different participating business units onto a continuum. The scores make it clear to distinguish differences in certain capabilities. However, the scores may or may not be related to the organizational structure design. Therefore, the differences in the tool outcomes can possibly be related to the organizational structure with the help of the interview results. Furthermore, these results make it possible to specify the later recommendation more precisely on the basis of the position of the business units on the servitization continuum. During the interview analysis, the interview guide structure will help to structure the overall analysis.

All interview transcripts are coded according to an open and axial-coding approach, based on the constructs and related topics. Based on the descriptions of the organizational structure dimensions, an organizational structure is outlined consisting of the pros and cons of the structure, whether the structure is in line with the strategy, and which factors are important for a change in the organizational structure to succeed. These summaries were sent to the participants in order to validate the findings and sketches. Moreover, quotes are used to strengthen statements.

In order to analyse the transcribed interviews a within case analysis will be carried out at first, in which each business unit case will be discussed in terms of servitization and organizational structure. After the within case analysis, a cross-case analysis will take place in which the results per dimension are compared with each other. During both analyses pattern matching is used to figure out connections in the data (Tracy, 2013; Yin, 2017). Furthermore, based on quotes related to the discussed constructs and the abovementioned data, a recommendation is formed to answer the research question.

In summary, a pattern-matching logic was adopted to analyse the results of the interviews and the theory. The total data analysis process can be described as an iterative process in which findings from both practice and theory are systematically combined. According to Yin (2017), the internal validity of the case study increases by the coincidence of the aforementioned patterns.

3.9 Reliability & Validity.

According to Yin (2017), there are four tests that are used to establish the quality of case study research, namely construct validity, internal validity, external validity, and reliability. Construct validity refers to the identification of correct operational measures for the studied constructs. Internal validity seeks to establish a causal relationship, whereby certain conditions are believed to lead to other conditions. The external validity is concerned with whether and how case study findings can be generalized. At last, reliability is concerned with the repeatability of the measuring procedure and results. For this research, it is of importance to achieve a decent construct validity. If the construct validity is met, then observations will reflect events instead of the researcher's impression (Yin, 2017).

3.9.1 Reliability

In order to address the reliability of this research, several aspects have been considered. The interview guide and the clarification in Dutch of the tools help to create a certain consistency as well as mutual alignment between the interviewer and the interviewees. Each step of the data collection method is documented and presented to the participants and, if necessary, explained in more detail. Furthermore, reliability is also addressed by the fact that pre-defined constructs have been used to ensure consistency. Moreover, these definitions have been derived from the literature study. At last, validated tools have been used during the data collection. Thus, the usage of these tools contributes to the overall reliability (Yin, 2017).

3.9.2 Validity

As Yin (2017) mentioned, validity refers to the relationship between measurement and the concepts. Therefore, a researcher should ask if he/she measures what is intended to be measured. To address construct validity multiple sources besides the beforementioned data collection methods are used in order to collect data. At first, the theoretical framework has operationalized multiple important subjects like servitization and organizational structures by means of different dimensions that have already been validated. Second, company documentation like presentations, webpages and annual reports are used to data. Third, the organizational structure sketches and explanations are reviewed by the participants. Therefore, data triangulation and data reviewing by the participants has been utilized to enhance the construct validity and reliability of the results (Yin, 2017).

To address the internal validity pattern matching logic has been applied during the data analysis. Pattern matching attempts to capture the relationship between important aspects of this research, like organizational structure dimensions and servitization. Yin (2017) states that the identification of special tactics in order to achieve internal validity is difficult to identify. As a result, no method is developed in order to address the internal validity. Finally, external validity is addressed by utilizing extensive theory throughout the study to increase validity. By using multiple interviews and a combination of validated tools the external validity is enhanced. In addition, the interviews are conducted in a context that shows similarities with previous related research. However, the participants fall under the same corporate identity, which lowers the generalizability of the results.

3.10 Tool Comparison

During the process, several choices regarding the measurement of the conceptual model have been made. In today's literature, there is no consensus about a specific measurement tool or questionnaire to measure the maturity of the servitization process or the degree of servitization. Moreover, there is no valid operationalization of 'servitization maturity' regarding organizational structures that enables assessments about the maturity of the business units.

For this research we are looking for a well-founded and validated comparable basis from which we can further investigate what a viable organizational structure is to offer product-service systems. Literature shows a diversity of servitization maturity measurement tools. Nevertheless, none of the proposed measurement models is adopted as the general servitization maturity measurement tool because the tools are tested in specific conditions. Hence, it is difficult to generalize and validate the outcomes. For this reason, we compare five potential maturity measurement tools to come up with a method which is aligned with the organizational structure literature and the proposed conceptual model. The purpose of the method is to make it possible to describe the state of the servitization maturity/readiness of different business units in a concrete and comparable manner. Therefore, this method will consist of different elements from multiple tools that align with the degree of servitization, the structural organizational dimensions and the contextual factors related to servitization and organizational structures. Eventually, the gathered insights will contribute to the recommendation regarding a viable organizational structure to offer product-service systems.

As a result of the research scope and the conceptual model, the combined method is not intended to measure the exact maturity of the servitization process. Instead, the combined method needs to ensure that the different (non-) servitized business units are comparable, so that the recommendation is based on the relevant scored elements, the current organizational structures that have led to these scores, and the effects of specific practices with regard to organizational structure on (servitization-)performance of the business units.

During the comparison the aim of the proposed tool is given as well as a brief description, the purpose, the pros and cons, and argumentation why the tool or certain elements were chosen. The tools that are being compared are from the following papers:

- Alvarez, Martins & Terra da Silva (2015): “Applying the maturity model concept to the servitization process of consumer durables companies in Brazil”.
- Gudergan, Buschmeyer, Krechting & Feige (2015): “Evaluating the readiness to transform towards a product-service system provider by a capability maturity modelling approach”.
- Rapaccini, Saccani, Pezzotta, Burger & Ganz (2013): “Service development in product-service systems: A maturity model”.
- Coreynen, Matthyssens, & Gebauer (2018): “Are you ready for servitization? A tool to measure servitization capacity”.
- Lindgreen, Palmer, Vanhamme & Wouters (2006): “A relationship-management assessment tool: Questioning, identifying, and prioritizing critical aspects of customer relationships”.

1: Alvarez, Martins & Terra da Silva (2015).
Aim: The model aimes at typical manufacturing companies that already provide after-sales services and aim to add services to their portfolio. This research proposes a maturity model, based on a literature review and case studies, that helps servitizing companies to identify potential critical requirements to better position the company in the market. This model has been tested in an IT company, a telecommunications company, a household appliance factory and an auto parts business. For the pilot case study the largest information technology company of the world is selected.

Description: The proposed model is based on relationship maintenance, which is divided into four different levels of analysis, namely:

- Customer
- Network
- Market
- Internal

These four levels of analysis are analyzed throughout the servitization process to come up with plans on how the levels should be taken into account. According to PMI (2003), a maturity model is defined as a guide that companies can use to achieve desired results in a reliable, sustainable, and reproducible manner. Furthermore, literature shows that maturity models are composed of critical requirements that have been defined for each stage. These critical requirements have to be evaluated in order to place a company in any position within the maturity models. For this model, the critical requirements take shape during the servitization process and are derived and obtained from the literature to create a maturity model concept. Eventually, new critical requirements have been added and positioned in the model as a result of individual experiences that emerged from interviews. Each of the critical requirements relates to an element that needs to be specified during the assessment of a servitizing organizations.

In the model, the levels of analysis and the critical requirements have been linked to the four phases for servitization, namely:

- Prospecting
- Initiation
- Consolidation
- Specialization

Taking into account the maturity model, all four proposed levels of analysis are correlated with the four phases of servitization. This correlation allows the positioning of servitizing companies into a specific phase. It is not uncommon that companies move to the next maturity level without fully completing all the expected critical requirements. The maturation of the requirements is not linear during the entire process, because of the difference in complexity to develop each specific critical requirement. Hence, the correlation can only be used as a reference because of the dynamic character of the model.

Purpose: Better understand servitization maturity levels. This maturity model is aimed at the servitization process, therefore the model can be used to guide companies to achieve their servitization goals. During this study, companies in the sectors of information technology, telecommunication, household appliances and auto parts are investigated.

Pros (+) and cons(-):
– The model should be further refined in subsequent studies.
– Case specific
+ The maturity model is constructed and validated.
+ The maturity level of servitization can be understood and evaluated through specific critical requirements that characterize the relationship with the market, the network and its internal and external customers.
+ It provides necessary steps to be followed in each phase.
+ Addresses some of the concerns that require special attention.

	Servitization phases			
	Prospection	Initiation	Consolidation	Specialization
Customer profile	Customer product	Customer product + value added	Value added customer + product	Service client
Company profile	Manufacturing	Manufacturing + service	Service + manufacturing	Service
Type of service	After-sales focus (warranty and T&M)	Focus on reactive repair contracts	Focus on proactive repair contracts	Focus on product availability and sales solution contacts
Processes maturity	Informal/ organized	Well structured	Managed	Optimized
Process characteristics	Absent process concept/main processes defined	Standardized procedures and the beginning of the uses of indicators	Consistent indicators and integrated and aligned processes	Continuous process improvement
Series of critical requirements that characterize...	...market level of analysis			
Brand differentiation	✓			
Financial model	✓			
Review of the mission	✓			
Competitors identification	✓			
Installed base market and its potential	✓			
Solutions already existing in the market	✓			
External marketing	✓			
Innovating services				✓
Series of critical requirements that characterize...	...network level of analysis			
Company repositioning in the value chain		✓		
Partners and alliances definition		✓		
Systemic integration with partners and suppliers		✓		
Process standardization in the chain		✓		
Performance control of the chain			✓	
Acquisition of strategic partners and sale of less attractive sectors				✓
Series of critical requirements that characterize...	...customer level of analysis			
Contact with potential clients	✓			
Value cogeneration		✓		
Customer training		✓		
Customer satisfaction		✓		
Performance report		✓		
Knowledge of solution criticality			✓	
Systemic integration with the customer			✓	
Test of new technologies with the customer			✓	
Knowledge of the customer's installed base			✓	
Loyalty				✓
Series of critical requirements that characterize...	...internal level of analysis			
Specialized area focused on services			✓	
Risk assessment and management				✓
Integration between the area of product development and after-sales services			✓	
Integration between Sales and After-sales services			✓	
Integration of Human Resources and After-sales services			✓	
Integration with employees		✓		
Systemic integration of internal areas			✓	

Figure 9 Maturity model servitization (Alvarez et al., 2015)

Argumentation:
We did not choose this maturity model because of a couple of reasons. Despite the fact that this maturity model is validated, the model and certain parts of this model are not chosen to be used, because it is not focused on the factors that influence the choice regarding the most viable organizational structure. Figure 9, the boxes of the requirements only have to be checked off. Thus, when a company or department has a certain critical requirement this maturity model does not say something about the level of development of this critical requirement. This information has to be gathered by conducting interviews.

2: Gudergan, Buschmeyer, Krechting & Feige (2015).
Aim: This study introduces a concept to evaluate the readiness for transformation towards a solution business. This paper focusses on the determination of change readiness and the success factors of the transformations from an organization towards a solution business. To ensure the success of the implementation strategy this study addresses specific process areas of the organization.

Description: Specific attributes of the organization, the content and the intended change process are analyzed to eventually make the change readiness more tangible. These different components of change readiness are being broken down to smaller units to build up the framework. As a result of this division of components into smaller specific components, the measurement became very precise. In overall, the assessment to evaluate the readiness is based on a Capability Maturity Model Integration (CMMI). CMMI is a process model that can be used for different purposes, namely for process description, documentation, and as guidance for process improvement. CMMI can also be implemented in two processes to ensure the improvement of these processes, namely in a:

- staged representation process
- continuous process

There are several ways to implement change. One way to implement change is by switching between the two beforementioned approaches. The staged representation of the CMMI focuses on the maturity of the required steps and distinguishes five levels of maturity from initializing to optimizing. At the first level, the process program and the process areas are not implemented yet. At the second level the process areas are implemented. These process areas then are used as a guide for the project and process management practices. In the third level, the defined level, several new process areas are being adopted. During the fourth level product and processes are quantitatively controlled and finally, in the fifth level the company-wide focus lies completely on process and project improvement.

Maturity levels represent the process capacity and also contain important process areas in which the importance of setting goals, as discussed earlier, is established and achieved. Skipping maturity levels can be counterproductive, because often the inferior level is a necessary foundation for the superior level. When a level is skipped improvements are more likely to fail.
The continuous approach provides greater flexibility, sequenced priorities and establishes a life cycle view, which is in contrast to the staged CMMI. In the continuous approach the relationships and the dependencies between the stake-holders are much clearer than by the staged approach. In summary, the continuous approach focusses on the characterization of inherent processes of an organization making it possible to focus on specific areas of an organization instead of an individual process area. With the continuous approach improvement is measured by capability levels that are being divided into four steps from incomplete (0) to defined (3).

When the capability levels and the maturity levels of both representations are merged the outcome leads to a capability scale consisting of six levels from 0 to 5, namely:

- (0) Incomplete
- (1) Performed
- (2) Managed
- (3) Defined
- (4) Quantitatively managed
- (5) Optimized

Eventually, in the proposed framework these maturity scales are aligned amongst the axes from the center, starting from level 0 to Level 5, see Figure 10. The model is in the shape of a radar plot and is called the Business Transformation Readiness Assessment (BTRA). The BTRA is grouped into four superior categories, namely Strategy, Design, Delivery and Leadership & Communication.

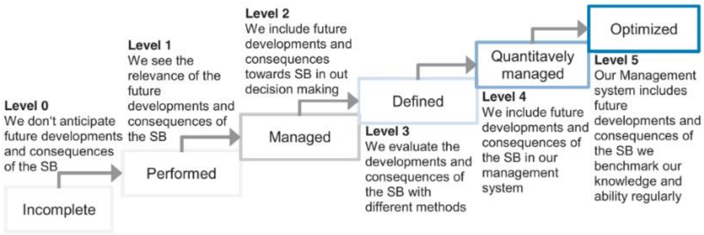

Figure 10 Maturity scales framework (Gudergan et al., 2015)

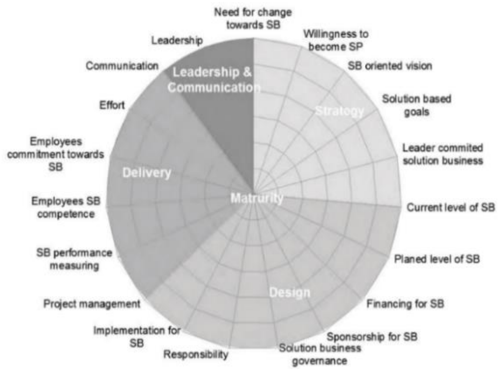

Figure 11 Business Transformation Readiness Assessment (Gudergan et al., 2015)

Furthermore, the BTRA consists of 19 key elements that are derived from the literature on transformation readiness. These 19 key elements, which are placed on the outside of the radar plot, are divided into the four categories mentioned above, see Figure 11. The BTRA is a tool that is aimed at the senior management of organizations. According to the authors it is their task to evaluate the maturity level, based on the key elements that were dealt with in the form of a survey. Not all aspects should be equally weighted, but there are no guidelines for the measurement distribution.

Purpose: The framework is based on a review of relevant published work on the topic of transformation readiness. The BTRA is developed and tested to assess a companies' readiness for transformation towards a solution based business. The model was tested in two companies. One company is active in the goods industry supplying rail vehicles, the other company is a German company operating in the mechanical engineering and construction sector.

Pros (+) and Cons (-):
+ Elements are derived from literature
+ Aimed at senior management
+ Maturity Model and Key elements combined
– Questionnaire not included
– Not clearly defined the key elements
– Not tested & validated in relevant sectors
– Not a clear link between key elements of solution business and organizational structure
– No guidelines for the measurement distribution

Argumentation: At first sight, this maturity readiness model seemed appropriate to use, especially certain elements. Unfortunately, after better examining the assessment tool and the way it is compiled, it has been concluded that it is difficult to use certain key elements. This is due to the absence of the questionnaire that has been used to measure the maturity and the lack of clear definitions of the key elements. It is also difficult to link the key elements to the factors that influence the choice regarding the organizational structure. Besides that, the BTRA is tested in sectors that aren't relevant for the research. As a result of all the above, the BTRA will not be used in this research.

3: Rapaccini, Saccani, Pezzotta, Burger & Ganz (2013).
Aim: In this paper a maturity model (MM) is proposed to evaluate the new service development (NSD) processes of product-centric firms that deliver product service systems (PSS). The empirical application of the model was tested by means of an intercompany workshop and in-depth interviews. In other words, this paper proposes a MM for product-centric companies to assess the maturity in NSD. This paper aims to fill the following gap: "there is not developed a MM to assess the capabilities of NSD of product-centric firms yet".

Description: The model consists of a five-stage scale that follows the structure of the Capability Maturity Model (CMM) wherein key elements are evaluated by the following dimensions:

- The management of processes and projects
- The use of specific resources, skills and tools
- The involvement of customers, suppliers and other stakeholders
- The adoption of performance management systems

For each dimension a number of key elements were identified to shape each level of maturity in detail. The CMM consists of the following maturity levels:

- (1) Initial state
- (2) Repeatable
- (3) Defined
- (4) Managed
- (5) Optimized

The underlying idea behind MM's is that a the higher the maturity level, the more management possibilities there are in specific domains/processes. During the research the following research steps stated in Figure 12 have been followed to come up with the final proposed MM. The authors choice to combine a workshop with interviews because the authors followed the line of thought that describes the importance of team applications and workarounds in new product development. The selected companies participating all differed in terms of industry, nationality, role in the supply chain, and size. During the assessment of the maturity model three main methodological tools have been used, including a reference model that has been developed at Fraunhofer IAO.

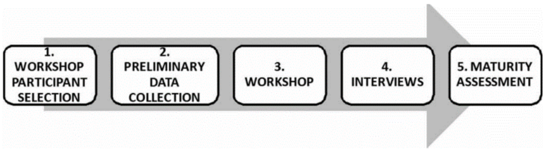

Figure 12 Research steps (Rapaccini et al., 2013)

During the workshop the authors used a methodological tool to support the interactions that took place. The tool that has been used can be found in Figure 13 and already proved its practical value in numerous projects and workshops carried out at Fraunhofer IAO.

Figure 13 Workshop steps (Rapaccini et al., 2013)

The NSD process model was created a basis and a common language among the different participants during the workshop. During this workshop all the participant had to analyze their 'work methods'. This analysis contributed to the awareness and personal knowledge of the participants. After a couple of months the participants were asked for in-depth interviews. Eventually, all information is gathered and summarized in a cross-case classification of the maturity level of the NSD processes, see Figure 14.

Purpose: The proposed maturity model can be used to evaluate the new service development processes, but also to identify the main gaps. Improvement actions can be derived and prioritized from these gaps. This proposed MM could fulfil descriptive, prescriptive and comparative purposes.

Pros (+) and Cons (-):
+ Based on different theoretical models
+ Participants from different industries
+ Clear description of dimensions and the related elements
+ /- Focused on PSS but focused on capabilities for NSD
– Takes a lot of time because the interviews are taken after a few months
– Hard to compare different business units/departments
– Hard to link to organizational structure

Argumentation: We did not choose this model because because the in-depth interviews that need to be conducted have to be taken a couple of months later. Also, it is very hard to create a workshop around the specific research subject. The maturity tool, see Figure 14, is hard to link to the factors that affect the choice regarding a viable organizational structure. In this research paper the in-depth interview questions and the workshop outline aren't published. For this reason it is almost impossible to reconstruct both so that the outcomes are comparable and valid. Another important issue is the fact that the participants are active in a variety of industries, but none of the industries are comparable with the industry wherein Company-X is active. The format should also provide a useful format for creating more customer value.

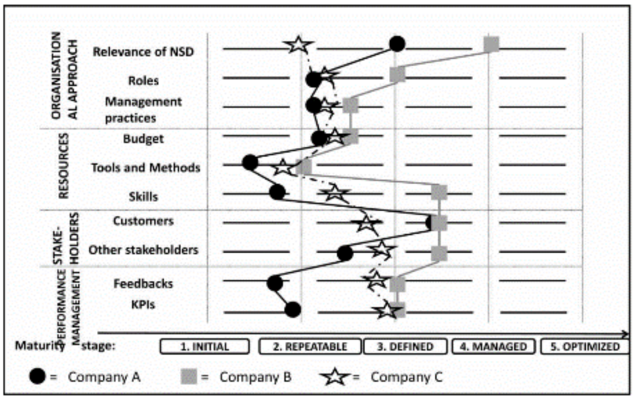

Figure 14 NSD maturity level tool (Rapaccini et al., 2013)

4: Coreynen, Matthyssens, & Gebauer (2018).

Aim: The aim of this paper is to address the call for a new practice-oriented methodology that not only focusses on improving the hybrid offering itself but also considers the context in which new offerings are created and deployed. A holistic perspective that considers the whole organization is increasingly used to support manufacturers in servitization. The aim is to offer a tool that can be used to measure a firm's general capacity for servitization and can be used by both academics and practitioners. In short, a toll will be introduced to measure and assess a firm's capacity for servitization. Insights in the strengths and weaknesses for servitization can be gathered and discussed. Eventually, the readiness for servitization for a department or firm can be determined.

Description: The tool, based on 'the Strategy Map op Servitization' and 'the Roadmap for Service Strategy in Action', focusses on three organizational factors that contribute to a firm's ability to successfully evolve into a solution provider, namely:

- Capabilities for service development
- Capabilities for service deployment
- The service orientation of corporate culture

The holistic approach that is used to construct this tool contributes to a better understanding of servitization, because it strengthens the firms competitive advantage by linking organizational factors and strategic choices. The perspective can bring benefits to companies that are difficult for competitors to copy and isolate.

The tool consists of 48 questions that relate to the three service-related organizational factors. Each question needs to be rated on a 7-point scale ranging from 0 (entirely disagree) to 7 (entirely agree). High scores do not guarantee servitization success. However, the scores are a strong indicator of the company's/departments readiness for servitization. The tool offers a quick way to assess the capacity for servitization, pinpoint and reflect on potential areas of improvement. Based on the results companies may start to remedy specific areas with lower scores for servitization. One way to remedy these specific areas is to involve external parties such as advisers, consultants and training institutions that will eventually help to boost the scores. Another way to boost the scores is to exchange and leverage experience among different teams, business units and even different companies.

In order to answer all questions correctly, the person must have in-depth knowledge of the organization. As a result of the complexity and knowledge requirement, the tool focuses on managers of an organization/company. The following subjects to measure the capabilities will be addressed:

- Sensing
- Seizing
- Reconfiguring capabilities
- Digitization
- Mass service customization
- Network management
- Value of managers/employees
- Behaviour of managers/employees

To visualize the results into a radar diagram an average score for each construct can be calculated, see Figure 15. Each radar diagram is comparable with the other (non-) servitized business units within the company. It may be that a non-servitized department will score higher than a servitized department and as a result will realize that the department is 'ready' to servitize.

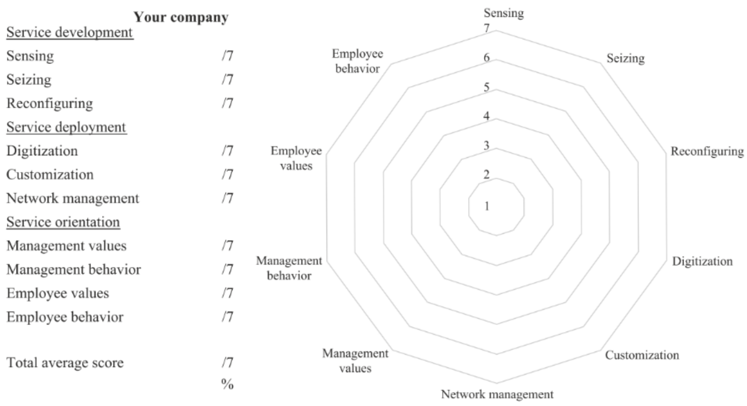

Figure 15 Visualization Servitization readiness score (Coreynen et al., 2018)

Purpose: This tool can be used for multiple purposes because this tool complements other tools as a preliminary analytic step before further action. Even when this tool is used as an internal assessment tool it complements other methods that focus on the environment in which firms operate. This tool can also be employed to leverage experience among different teams, business units and companies.

Pros (+) and Cons (-):
– The tool misses several important factors that are not included such as skills related to value selling, methods for personnel recruitment, training and assessment, and the proximity of the service organization to the customer.
– The tool does not include any financial or some kind of performance figures
+ Easy way to gather insights in the servitization readiness of several companies
+ Easy to visualize results and compare them with other business units
+ Great starting point to figure out which configuration of the organizational structure leads to these scores
+ Contains and measures some parts of important contextual dimensions of organizational structure such as culture, environment and organizational technology
+ Quick way to assess the capacity for servitization
+ Pinpoint areas for improvement
+ Results can be visualized in radar plots

Argumentation: We choose this tool because it generates insights in the servitization readiness and creates valuable insights for servitized and non- and semi-servitized business units. It creates insights in the capabilities for service deployment, development and it creates a deeper understanding in the service orientation of organizational culture. The holistic approach that is used contributes to a better understanding of the current servitization and it strengthens the competitive advantage. One of the most important reasons why we chose this tool is that it contains and measures some of the important contextual dimensions of organizational structure. Furthermore, another big advantage is that the scores will be plotted in a radar plot which makes it clear and easy to compare. This tool is a great starting point to describe a certain maturity/readiness per business unit because it pinpoints the strengths and weaknesses regarding organizational factors related to servitization. These outcomes are not only useful for BEAT, but also for every attendee. Furthermore, the capabilities that will be addressed relate to the foundation of the 'servitization house' by Fliess & Lexutt (2019), see Figure 6 (p. 14).

5: Lindgreen, Palmer, Vanhamme & Wouters (2006).
Aim: This tool is used to set goals based on the actual score and the targeted score of each element with regards to relationship management. The gaps between the two scores form the basis of a discussion as to how the gap needs to be filled. In short, the tool is used for assessing and further improving the organization's capabilities regarding Relationship Management (RM).

Description: The authors chose the automotive industry to be examined, because the scale, it remains a major contributor of national economies, its network of suppliers and the associated relationship development and practice. For this paper a single-case approach is used in combination with secondary data and multiple interviews. This made it possible to generate in-depth insights that also form the basis for the transferability of the findings to other contexts.

A practical tool has been developed to question, identify, and prioritize critical aspects of customer-relationship management. Relationship marketing is for building more unique relationships with customers by adding more value to goods and services. The focus of RM is both on long-term relationships and short-term transactions. A comprehensive literature review was conducted to identify elements in the area of relationship management. Afterwards, the identified elements were organized into 10 different key areas. These elements were complemented by information that was derived from in-depth interviews. All interviews were transcribed and organized. This organization helped to guide the authors with finding codes, themes and patterns in the interview transcripts.

The tool consists of relevant RM elements with each with its own appropriate developed scoring system. The number of RM elements resulted from the data analysis and were systematically ranked by the interviewees and industry experts. Each element has 11 scale levels ranging from 0 to 10. From the experience of the authors, this number of levels provides an optimal number with regard to meaningful interpretations of the levels and sufficient detail. The level 0 represents a minimum level and indicates an immature and non-sophisticated RM structure, while level 10 represents the maximum and indicates a mature and well-managed RM structure/program. For each element the minimum and maximum score were defined before the remaining element scores were defined. Eventually, all remaining elements were ranked systematically. The whole process was conducted iteratively, by consulting the original interviewees and the industry experts throughout. A summary of the process can be found in Figure 16.

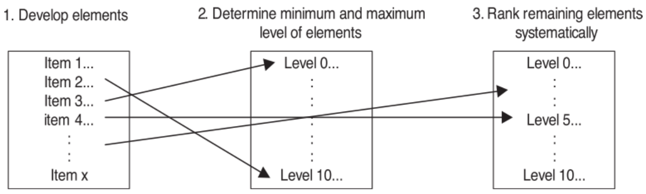

Figure 16 Element development process (Lindgreen et al., 2006)

The following RM elements have been derived:

- Customer strategy
- Customer-interaction strategy
- Brand strategy
- Value-creation strategy
- Culture
- People
- Organization
- Information technology
- Relationship-management processes
- Knowledge management and learning

The assessment tool can be adopted as a scorecard. Scores could be visualized via a radar diagram. This makes it easier to compare different departments and organizations. It provides a simple format to monitor the implementation of a RM-program.

Purpose: The purpose of this RM tool is to help managers to identify, prioritize, question and make explicit critical aspects of customer relationships (transactional/relative). This makes it possible for managers to shift between different types of relationships. The assessment tool also provides a means whereby gaps between different elements can be located and relevant targets can be set to overcome the gaps.

Pros (+) and Cons (-):
– The tool is based on a single-organization approach
– Not all elements are relevant for this research
– Tools validity is questionable because customer input was obtained indirectly
– The value of the cool only becomes apparent when it can be linked with desired organizational outcomes
+ Easy way to gather insights in Relationship management elements
+ The tool makes cross comparison on organization basis possible
+ Results can also be visualized in radar plots and the tool can be linked to other measures to give a more comprehensive relevant summary of performance.
+ The elements that will be scored are important after the servitization process
+ Contains and measures organizational structure and culture
+ Splits up strategy in four measurable elements
+ Pinpoint areas for improvement and elements related to the organizational structure dimensions

Argumentation: We choose this tool because it complements the servitization capacity tool (#4). During the servitization process, (long term) customer relationships become more important to distinguish yourself from competitors. Relationship management focuses on adding value to goods and services and focuses on both long-term relationships and short-term transactions. Moreover, this tool is linked to the strategic driver of servitization, because one of the important aspects is to create a certain customer relationship lock-in. These relationships should be handled and managed with care and policy. Furthermore, some of the elements are important factors and are linked to the degree of servitization, servitization and the organizational structure dimensions. One of the important reasons is that this tool splits up the strategy into four more specific strategy components. Furthermore, this tool also pinpoints areas for improvement for all attendees. What is also important is the fact that this tool scores the element of organization. This element is closely related to the organizational structure. Almost every element will be scored and used except the element Relationship-management processes, because this element is not relevant according to the scope of this research. This element focuses on the processes and is not one of the organizational dimensions. Finally, another big advantage is that the scores also can be plotted in a radar plot, which makes it clear and easy to compare. Together with the servitization capacity tool these scores make a great starting point to further investigate which organizational structures and practices make these scores possible.

4.0 Results

In this chapter, the results regarding the organizational structure case studies are described. It starts with organizing and presenting the business units on the continuum. This was done on the basis of the collected tool results and the business information. The main reason for the distinction is the extent to which the business units offer their services 'as a service'. This means that the offer is not offered on-premise but that the customers have taken out a subscription, as it were, whereby the customer only pays for the use of the product or service. Next, the results of the within case analysis and the cross case analysis are discussed. In the end, all results are used to answer the research question as formulated in the introduction.

4.1 Business unit continuum

The different business units have been introduced in chapter 3.4 (case study descriptions) wherein information about the mission, vision, strategy, products, and the markets to which the business units respond have been elaborated. On the basis of the interview results, contextual information, their strategy, type of offering and types of services the business units have been placed on a timeline. This timeline ranges from non-servitized towards servitized business units, see Figure 17.

Non-servitized means that the business unit does not deliver any offering based on a subscription model. Semi-servitized business units deliver one offering on the basis of a subscription model but still have a hardware related proposition. Fully servitized business units only offer their propositions on the basis of a subscription model.

Results have shown that Business unit-I is in a transition. However, it is not a servitization transition. When looking at the propositions of the business unit, it can be stated that there is a proactive service related unit attached to the propositions. However, the software services are not provided on a structural basis. As a result, services do not play a big role within this business unit. For these reasons, we have labelled Business unit-I as ‘non-servitized’.

Next, Business unit-Y and Business unit-L both offer services on a structural base. However, these services are mainly focused on increasing the efficiency during the roll-out or instalment and reduce the overall risk. Furthermore, Business unit-Y delivers technical services like training courses in order to train their partners in the field. At this moment, both business units do offer subscription-based software services. With this service, customers pay a fee that entitles them to the latest software updates and versions. However, the services still play a small role within the business units. In addition, Business unit-L, together with KPMG, conducted a study to the financial consequences of servitization might be. As a result, both business units Y and L are positioned between ‘non-, and semi-servitized’.

On contrary to Business unit-I, Business unit-R and Business Unit-C both a hardware proposition and a SaaS related proposition to the market. Within both business units software services, partly support software, are based on a subscription model whereby users pay a monthly fee that gives access to the latest versions and updates. However, these business units still deliver hardware propositions to the market. Both business units do have experience with a SaaS business model, it is a big part of their overall turnover, but still deliver and sell on-premise systems. For these reason, we have labelled both business units ‘semi-servitized’. Finally, Business unit-S and Business unit-H have been labelled ‘servitized’, because both business units only deliver services via a subscription model and do not offer or sell any on-premise systems.

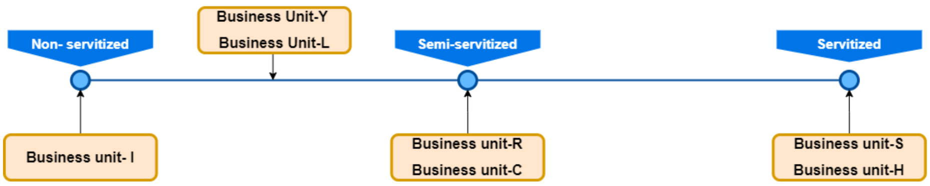

Figure 17 Timeline Business units

In addition, all tool results per business unit will be briefly discussed. In the end, the average scores of the business units will be looked at and discussed. After the tool results are discussed, the within case analysis follows in which the business units are discussed in terms of servitization and organizational structures.

4.1.1 Business unit-I

When looking at the tool results, see Figure 18 and 19, it is noticed that the managing director scored the organization, the people, management behaviour and employee behaviour almost the maximum. People and Organization can be seen as 'outliers' regarding customer relationship management. Moreover, the related scores can be interpreted as a sign of trust in the people and how the organization is structured. However, as a result of the transition, the manager knows that a lot of work needs to be done, especially in the strategic area.

Figure 18 Results Bu-I Servitization readiness

Figure 19 Results Bu-I Relationship-management

4.1.2 Business unit-Y

The radar plots, Figure 20 and 21, indicate that people have the maximum score regarding the relationship management tool again. Furthermore, network management, management values and employee behaviour score almost the maximum. The network management might be related to the indirect business model of the business unit. Relations with their business partners are crucial for the overall performance.

Figure 20 Results Bu-Y Servitization readiness

Figure 21 Results Bu-Y Relationship-management

4.1.3 Business unit-L

What pops-out of these results, see Figure 22 and 23, is the low score for customer-interaction strategy. However, this low score can be explained by the fact that the business unit does not supply its products directly to the end customer. There is always a party in between. This is one of the reasons why the business unit started an investigation into the consequences of servitization with KPMG. Furthermore, as with the previous business units, people are rated highly.

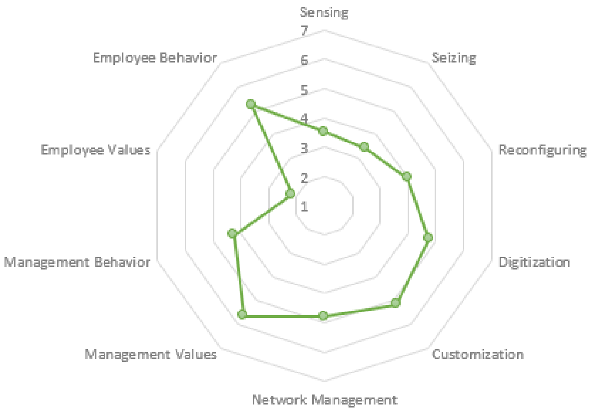

Figure 22 Results Bu-L Servitization readiness

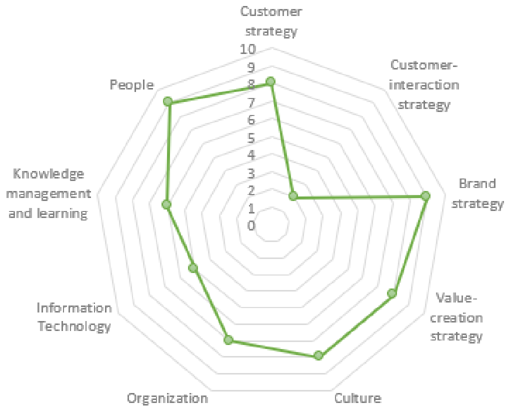

Figure 23 Results Bu-L Relationship-management

4.1.4 Business unit-R

After a quick look at the results, see Figure 24 and 25, we see that the department scores fairly equally in the area of servitization readiness. There are no real outliers, both in a positive and a negative sense. On the contrary, when looking at the relationship management scores, there are a few outliers, of which people is one in a positive manner and information technology and customer strategy in a negative manner. The cultural score might be explained by the fact that the business unit currently brings a hardware and software proposition to the market under one roof. Therefore, both cultures might affect and conflict with each other.

Figure 24 Results Bu-R Servitization readiness

Figure 25 Results Bu-R Relationship-management

4.1.5 Business unit-C

The servitization readiness scores, see Figure 26, do not show any outliers and mostly located between 5 and 6, except management behaviour. On average the scores are very consistent. However, when looking at the relationship management scores, see Figure 27, it is noticeable that there is a big difference in the scores. The strategy related components were assessed lower than the other components. This may be due to the fact that the business unit has undergone a re-organization in recent years, see Appendix IX interview transcriptions, Business unit-C.

Figure 26 Results Bu-C Servitization readiness

Figure 27 Results Bu-C Relationship-management

4.1.6 Business unit-S

In the servitization readiness scores, see Figure 28, it is noticeable that on average around the median was scored, except for digitization. Moreover, information technology is also quite low in comparison with the rest of the scores, see Figure 29. However, it is not entirely strange that these two subjects score low. This is because both subjects are talking about similar, often linked, systems. In addition, what pops out is the fact that people, organization, culture and knowledge management and learning score relatively high.

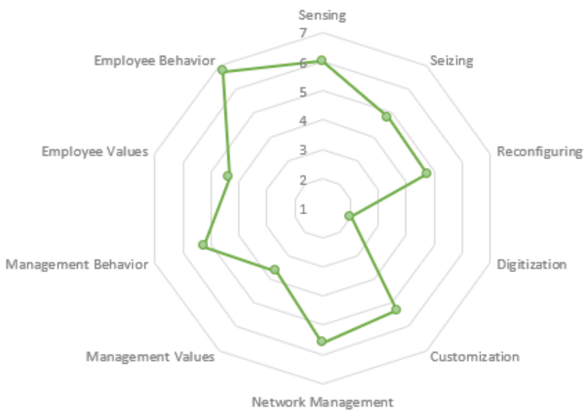

Figure 28 Results Bu-S Servitization readiness

Figure 29 Results Bu-S Relationship-management

4.1.7 Business unit-H

When looking at the results, see Figure 30 and 31, the scores for culture, people and management values pop out. In addition, information technology and knowledge management and learning score a bit low in comparison with the other scores. However, it is also striking that the customer strategy also scores relatively high. This may have to do with the fact that the business unit has formulated a clear strategy to want to be market leader in all three sectors.

Figure 30 Results Bu-H Servitization readiness

Figure 31 Results Bu-H Relationship-management

4.1.8 Average

In short, when looking at the average scores, see Figure 32 and 33, a number of things stand out. At first, 'people' are scored high. Therefore, it is stated that all business units at Company-X see 'people' within the organization as an important factor in a relationship management context. Second, 'organization' is the second best scored relationship management subject. Within the answers regarding the subject 'organization' flexibility, cross-functional communication and customers' needs and wants have an important role. However, during the interviews multiple respondents admitted that there is a knowledge gap regarding the customers' wants and needs. Hence, this is one of the reasons why the business units are servitizing or looking at the effects of servitization. Third, information technology and customer interaction strategy have been scored the lowest on average. Moreover, these two subjects are related to each other, because the customer-interaction strategy has to be scored on the basis of the use of information technology systems and addressing these technology systems to coordinate and manage the customer interaction. Fourth, when looking at the servitization readiness scores it stands out that the scores are close to 5.

Figure 32 Average scores Servitization readiness

Figure 33 Average scores Relationship-management

4.2 Within case analysis

Within this within-case analysis, the different business units are explored in more depth in terms of servitization, the structural organizational dimensions and the contextual factors. The order of the servitization continuum is maintained throughout the analysis.

At first, the respondents were asked if the business unit has gone through the servitization process. When the business unit had gone through the servitization process, a description of the 'old' organizational structure, in which all constructs were handled, was requested. Subsequently, the question was asked whether there are structural changes concerning the organizational structure during the servitization process. Initially, a description of the 'new' organizational structure was requested, in which all constructs had to be covered as well. However, if there were no structural changes, the current organizational structure was discussed, with the emphasis on the structural organizational dimensions and how servitization success can be, or is, achieved. During the data collection Respondent-I, Respondent-Y and Respondent-H made a drawing to substantiate their organizational structure description. These drawings can be found in Appendix-X (Interview Drawings) Subsequently, the transcriptions were encoded, elaborated and summarized in tables, see Appendix XI (Transcription tables). Thus, for each structural dimension, a sub-table was created in which statements concerning the dimension per respondent were summarized. These sub-tables were used in structuring the results. However, before elaborating further on the structural dimensions, it is important to have more knowledge of the basic principles on which the organizational structures within Company-X are based.

4.2.1 Business unit-I

Business unit-I is in a transition, however this transition is not related to servitization. Because of the transition, the business unit is still shaping the mission and vision. According to the managing director, questions regarding the mission, vision and propositions have to be answered from content deriving from the market. As the managing director states: "*The moment we do it the other way around, you can formulate something that might bind you as a team, but that is not necessarily the right direction you need for the propositions. If you look at what is binding us now, that is a certain mindset. The vehicle binds us*." *(Respondent-I, Interview Business unit-I)*.

Within the business unit there are no additional software-related services. However, there is a proactive service-related unit attached to the propositions, namely a team that is concerned with support and services towards the customers. However, when looking at the Triple-X platform, it can be stated that the business unit offers a cloud-based software solution. Unfortunately, the business unit does not have enough knowledge and experience to fully exploit the potential. When getting to the root off the subject of services, the business unit also has software services in its service offering. However, these software services are not provided on a structural basis. Nevertheless, within the business unit, there is high customer orientation. According to the managing director, the business unit is; "*on the eve of building up this type of services. The challenge we face is actually that we are not close enough to the market to exactly understand…. We have not yet sufficiently explored what our risk would ultimately be if we were to offer this fully as a service*" *(Respondent-I, Interview Business unit-I)*.

Within this business unit, the managing director has explicitly chosen to keep the organizational structure as flat as possible. For this reason, the current organizational structure consists of a maximum of four layers, namely the managing director, alignment members, team captains and team members. The business unit is also subdivided into five functional teams, namely Sales, Propositions, Marketing, Operations, and R&D. The alignment member/team captain ultimately bears final responsibility for the position in question. However, the managing director states that there is a difference between centralization and decision-making power. As a result, Respondent-I states that; *"at the end of the day, everyone in his or her own capacity is empowered to make decision up to a certain level. Ultimately, that person should be able to make his or her decisions as well as possible, actually independent." (Interview Business unit-I)*. The degree of decision-making authority should be set by the team members in agreement with the alignment member or the team captain. According to Respondent-I; *"Everyone has a limited span of control, no matter how wise or clever you are" (Interview Business unit-I)*. Furthermore, the alignment members/ team captains are responsible for communicating the full strategic direction of the business unit to the team below and to the overseas offices.

Returning to departmentalization, within the Operations team a distinction has been made between sales-, technical- and supplier-operations. Furthermore, R&D can be split into 'Devices' (hardware) and 'Software'. Within the chosen organizational structure, it is important that the right people are in the right place. This follows, among other things, from the following statement of Respondent-I, namely; "*it all starts with the right people, or with the good people. I think it is also important to put people in the right mix next to each other. Not necessarily the best in every discipline, but people who work together in the right way." (Interview Business unit-I)*. However, in line with the statements of Respondent-I, when the right people are in the right place in the organization, the organization is able to bundle insights from different perspectives so that a complete picture can be formed. The disadvantage of collecting these perspectives is that it can be time-consuming, which slows down the decision-making process because information from different perspectives has to be bundled constantly *(Respondent-I, Interview Business unit-I)*. For these reasons, it is important that processes are formalized by position and by people. This is in line with the following statement of Respondent-I, namely; *"At Company-X it always starts with people, 'first people, than technology'. In the end, I think that formalization helps to secure progress. You do not want to fall back or go back on previous decisions" (Interview Business unit-I).* What is important here is to ensure that there is a good balance between the various disciplines, that ensures that processes are organized in such a way that everyone can work together in a good way, leaving sufficient flexibility for personal initiative.

According to Respondent-I a good balance has to be found between sufficient and too much formalization. According to Respondent-I, specific positions in the organization require a certain kind of specialization. However, the connection between those specialists is the most important. In order to achieve this, a generalist is sometimes needed. Ultimately this leads to a higher synergy. Respondent-I is convinced that; *"to make a success of something, specific attention and focus must be given to it. Focus, not distraction, close to the customer, close to the market, while maintaining identity. I think that's important." (Interview Business unit-I).*

In order to generate a certain commitment within the business unit, it is important a commonly defined goal is defined argued from the market. According to Respondent-I "*there is nothing stronger than a 'commonly defined goal' argued from the market" (Interview Business unit-I).* Moreover, it is important that people get the information out of the market and that the solutions are also reasoned from the market. Finally, the culture within the business unit is a combination of the people, the products and the market in which you operate. The basis of the culture is derived from the overall culture of Company-X.

Within this structure the team captains/ alignment members need to communicate with each other and the team members so that everyone knows what is going on. In addition, a single point of contact is formed for specific questions in order to reduce the workload of certain people. Within Business unit-I the team captains/members are seen as the guardians of strategy and general progress, both qualitatively and productively. The communication within the business unit is strongly related to the infrastructure, because Respondent-I believes that a good (CRM) data driven preparation can create a certain 'trust' towards the customer. Therefore, the infrastructure systems within Business unit-I help to streamline the processes so that these become more effective and efficient.

4.2.2 Business unit-Y

On contrary to Business unit-I, Business unit-Y delivers software related services on a structural basis. At the moment the business unit has a vision that concerns moving from an indirect business model, whereby products are delivered via business partners, towards a direct 'as a service' model to bring them closer towards the end customer, eventually allowing them to innovate in a better way. This indirect business model has brought great success. However, this model is not very scalable. Another disadvantage of this model is that the business unit does not know exactly how the system is used in practice.

When looking at the services offered by the business unit, a distinction can be made between technical services and software-related services. The technical services are mainly related to training for business partners. Think of training courses. In addition to increasing the knowledge of the business partners, the technical services also have commercial advantages because nowadays re-certification courses are also offered. Software-related services include upgrade assurance. For a monthly fee, customers have access to the latest versions of the software and updates. The business unit also offers services related to the implementation of the current product. These services are primarily aimed at increasing effectiveness and efficiency and reducing risk for both the customer and the company.

The business unit is engaging in servitization in order to increase scalability and reduce the existing knowledge gap. According to Respondent-Y, one of the reasons for servitization stems from the strategic policy of Company-X. Within the business unit the direction and vision has been determined together with a club of people. This was not done entirely democratically, but with a selective group of ‘key players’. The organizational structure can be described as a pancake structure in which each pancake is responsible for a specific component such as Multinational Customers, Customer service operations or Partner experience. Furthermore, each pancake has its own team captain.

Within each pancake employees take on the responsibility when a problem occurs. Between all the pancakes, the Alignment team is active. On the basis of the vision/strategy, this team must monitor the direction of the business unit, especially decisions within the teams. At the same time, the Alignment team should facilitate and stimulate cross-functional communication. However, the people themselves need to find the right people to solve problems/projects. Furthermore, there are two people within the business unit who are really working full-time on the future. The results showed that the current organization has been built around the product, but is still flexible and agile. Respondent-Y states that; *“the product has partly determined the organization. However, the product is again a result of the market demand” (Interview Business unit-Y)*. Within the organizational structure, decision-making is decentralized in which there is not really a strong hierarchy. The managing director occasionally intervenes to communicate the direction, mission and vision of the business unit. During these interventions, explaining the 'WHY' is very important.

In the end, the managing director is responsible for the functioning of the people within the various pancakes. However, this structure can only function properly when the business unit has 'the right people'. The 'right' people must fit into the system. One consequence of the market translation is that there is a lot of specialism within the business unit. This is due to the fact that the product being marketed is very complex and requires a certain specialism. According to Respondent-Y specialization is a translation of the degree of complexity. However, the specialism is related to the old OEM mentality of "you ask for this, we make that" *(Respondent-Y, Interview Business unit-Y)*.

The culture within the business unit still resembles the OEM mentality. According to Respondent-Y, this will have to be changed. The culture is therefore related to the market you serve and the business model. However, there is a culture in which people are very dedicated. This also derives from the general Company-X culture, people feel that a specific name has to be cherished. Within the current culture synergy, taking on responsibility and taking initiative are key elements. Respondent-Y believes that, culture, decentralization and forming the direction and vision together will result in employees showing more initiative *(Respondent-Y, Interview Business unit-Y)*. The results have shown that formalization should help employees to resolve matters more quickly. As a result, formalization serves to outline standard frameworks with the aim of guaranteeing quality. According to Respondent-Y, formalization should be light-footed. It should not become a limitation for the employees. Too much formalization leads to a loss of flexibility.

In addition, Respondent-Y states that everything starts with commitment because; "*if you do not have a commitment then you get nowhere. Above all, you have to have commitment. That starts of course with the vision and strategy." (Interview Business unit-Y)*. Several sessions are held within the business unit in order to increase commitment. An example is the round-table session in which the question "do you understand why we are pursuing the strategy and what does this mean for you?" is central. Furthermore, surveys are used to gauge whether everyone agrees with the vision and strategy and what can be improved not only for the business unit but also for 'the management'. KPIs and a business review also contribute to increasing the 'feeling' for the business.

Finally, Respondent-Y strongly believes in the exploitation vs. exploration model and in the book 'lead and disrupt'. Those theories have become leading. When switching to 'as a service', Respondent-Y claims that he is not so afraid of the organizational structure because the structure will be adjusted. According to Respondent-Y; "*The pitfalls are more in the area of product strategy, that we are currently making choices, or not making choices, which you will come across later." (Interview Business unit-Y)*. The challenge is not so much the organizational structure, but whether the business unit has the right people and competencies. This is emphasized by Respondent-Y in the following statement; *"we do not worry about the organization that much, because the organization is quite flexible. It is the question 'do I have the right people on board?'. Not structure but competencies, that is also a challenge. Do I have the right competencies on board?" (Interview Business unit-Y)*.

4.2.3 Business unit-L

Like Business unit-Y, Business unit-L has taken small steps towards servitization. Results show that the business unit is investigating if their proposition can be offered as a service. Together with KPMG the business unit is researching the financial consequences. Similar to Business unit-Y, Business unit-L is offering subscription based software services. However, the services still play a small role within the business unit. The core of these services is to keep the system running and provide the customer with the latest updates. In the end the end-user pays to have the latest versions of the program. According to Respondent-L, updates are often related to bug fixes or extensions of functionalities. From experience Respondent-L states that; *"with the small step towards servitization that has been taken, it is more difficult to offer an existing product 'as a service' than with a new product" (Interview Business unit-L)*.

Within the business unit, the organization is organized on the basis of teams. In other words, a team structure has been applied. In addition, the business unit has two overseas sales and support offices that report directly to the managing director. Within the structure there are several sub-teams, each with its own discipline. As with the other business units, the teams have their own decision-making authority up to a certain level. After analysing the results, it appeared that within the R&D team a clear distinction has been made between hardware and software. Furthermore, the analysis showed that within the marketing, sales and operations teams a clear distinction has been made between the two segments pigs and cows. Within the teams there is one team captain per discipline. It is possible that there are several team captains in a certain team. However, there is always one person with final responsibility. For each segment there is a 'Sales Director' present. Respondent-L emphasizes that especially in sales, but actually everywhere, it is important to get the people in the early stages of the (servitization) process. This is evident from the following statement; *"You actually have to make sure in the early stages of the process that you get people on board" (Respondent-L, Interview Business unit-L)*.

Analysis has shown that the market plays an enormous role during the development of new propositions and products. According to Respondent-L, it is not the demand of the customer that needs to be considered, but the need. This should be the starting point for new developments. In these developments it is important that every discipline is involved because; *"you need every discipline to make it a success. You have to do it together!" (Respondent-L, Interview Business unit-L)*. When an opportunity arises in the market, different teams look at the possibilities and possible revenue. Based on this a decision is made.

Within the business unit, the specialization is related to the complexity of the product and the position of the employee within the organization. Frequently, very specific knowledge and skills are required within the R&D teams, while in general managerial positions require more of a generalist. However, it has become clear to the business unit that their flexibility is too high. This translates into the fact that the business unit is sometimes too quickly distracted by the daily routine. According to Respondent-L, it is sometimes better to say *"we finish this before we start with the new ideas" (Interview Business unit-L)*. In some cases, a customer with a large power influence has a problem. In that case, that power is sometimes 'abused' to ensure that these customers are given priority.

The culture is strongly linked to the sector in which the business unit operates. The culture is described as "down to earth". The prevailing culture is described as one in which the feeling prevails that people perform as a team and not individually. The people themselves are the most important factor but it is also important that the manager agrees that something is important. Within the unit there is a lot of respect for each other *(Respondent-L, Interview Business unit-L)*. As with Business unit-Y, people either fit into this culture or not. Within the organization there is a high degree of freedom to do things. But that freedom is accompanied by a certain responsibility.

Consequently, formalization is important because it can ensure that things are clear and straightforward for everyone. This is especially beneficial when the organization grows. Formalization can ensure that people create more clarity in their expectations. Within the business unit, formalization is used to create frameworks regarding quality and output. Freedom is beautiful, but one has to be able to deal with it. Within smaller teams this kind of information is automatically shared with each other, but as the departments grow, this automatism disappears *(Respondent-L, Interview Business unit-L)*. In order to promote the automatic sharing of knowledge, it was decided to make a book on the subject of "how does it work within Company-X?". Furthermore, this documentation is aimed to create frameworks that guarantee a certain quality. It also contains very simple things like "where do I get notebooks?". The aim behind it is, among other things, to create commitment among new employees and to clarify expectations.

According to Respondent-L commitment stems from the vision and strategy, especially from the belief in this vision and strategy *(Interview Business unit-L)*. It is the task of the team captains and managers to communicate the vision and strategy to the team members. When a new employee starts in the department, this person has two introduction weeks. A positive effect of these introduction weeks is that the employee immediately knows what is going on and does not just talk to close colleagues. An additional effect is that immediate commitment is created among both the current employees and the new employee.

Furthermore, within the business unit the cooperation between R&D, Marketing, Sales and Operations is of importance. When these disciplines are not involved in the whole process, a mismatch or an incomplete product can arise. Hence, synergy between these disciplines is important and can be strengthened through information sharing. For these reasons it is important that the managing director communicates the vision, especially with the team captains. The managing director regularly meets with the team captains several times a year to clarify/repeat the direction. In order to stimulate information sharing, monthly "highlight sessions" are held in which employees inform each other about what is going on. Moreover, the business unit uses a CRM system to make choices based on data. The system also provides more clarity and insight for the employees and is mainly used to make forecasts. In addition to digital systems, surveys are conducted to test employee satisfaction. According to Respondent-L, this contributes to creating a workplace where people like to work, are respected and want to work together for a positive end result *(Interview Business unit-L)*.

Finally, in the event of a change, it is important to inform everyone as early as possible why certain choices are or have been made. People have a natural resistance to change, but if you have commitment, people will work on things that are necessary to make it work *(Respondent-L, Interview Business unit-L)*. In addition, it is also important to explain why it is important for the continuity of the business unit. According to Respondent-L every employee should understand the reasoning behind the choices, in which managers play an important role in conveying this information. This is emphasized by the following statement: *"If the 'top' does not see that something needs to be changed, it will not succeed with the employees. Because of this, it is also important to have the right people in the right place. People are number one!" (Respondent-L, Interview Business unit-L)*.

4.2.4 Business unit-R

In contrast to the other business units, Business unit-R brings two propositions to the market, both a hardware proposition and a software proposition. Moreover, the business unit has multiple overseas offices and agencies. Currently, the business unit provides two types of services. The software services are based on a subscription model whereby the user pays a monthly fee for being able to use certain software. This software is partly support software. A platform allows the users to see which problems occur in the field. The second type of services is focused around global deployment, whereby the business unit can guarantee a certain level of quality worldwide. Finally, customers can get extended warranty varying from three until five years.

However, also within this business unit a team structure based on functionalities has been chosen. The organizational structure layers consists of a managing director with alignment members, team captains and team members. These alignment members are responsible for, for example, finance or operations worldwide. Alignment members mainly have to translate and communicate the strategy and vision to other employees of the business unit. At the same time, the alignment members monitor a constant quality and image and are responsible for the synergy within the business unit and abroad. Alignment members not only outline the frameworks for quality but also the appearance of a product/service taking legislation into account. Within Business unit-R, the triangle of product management, marketing and sales translates market needs. The same triangle also determines the appearance of the business unit in the market.

With the current organizational structure, the managing director wants to avoid that decisions are NOT made. Twice a year there is a strategic meeting with the alignment members to see whether the business unit is still on course and what the desired direction is. There is also an operational meeting every two weeks. In order to increase the transparency these meetings are recorded and communicated with everyone. From these meetings, issues often emerge that relate to the teams. Some issues can/may not be decided by the teams because the impact of these choices is too big. In those cases, the employees can call in the alignment member. According to Respondent-R the strategy has to be determined centrally. The decision-making authority concerning the day-to-day operations is delegated to the teams. This is emphasized by Respondent-R who states that; "*in principle, the team decides everything unless they cannot decide it. Each team has its own area of responsibility" (Interview Business unit-R).* Furthermore, Respondent-R emphasized this by the following statement; "*the how, how you do things, that's what you determine in the teams. So I'm not going to tell Hank how to please those customers. That's up to him. And if he has 6 customers, he has to start thinking about how he does that in case he gets 6 customers" (Interview Business unit-R)*.

Consequently, it is strongly in the culture that people who run into a problem look for each other directly. Within the group there is a culture of tremendous commitment. People want to work hard and are very dedicated to their customers. However, Respondent-R indicates that at the heart of the organization is still an OEM. This is related to the market and the strategy/vision. When an organization decides to servitize, it is important that people have the right mindset. Nonetheless, these people contribute to a different culture. Respondent-R is convinced that the culture is formed according to the market and its needs.

Within the current business unit there are multiple teams that are constantly changing. According to Respondent-R, the business unit is constantly active in the market and the organization is adjusted accordingly. For these reasons, something changes every few weeks within the organization. Nonetheless, within each team, each member has his or her specific tasks for which the employee bears responsibility. Within Business unit-R, the people themselves determine how their goal is achieved. So each team has its own area of responsibility. A team captain is responsible for ensuring that everyone knows his or her responsibility well. However, the team captain does have a duty to report to the alignment member.

The organizational structure has deliberately been made hierarchical because it was noticed that when the organization grows it becomes more difficult to keep everyone informed. Hierarchy provides standardization so that many things become clearer on an organizational level but also for the people who come to work at Business unit-R. This is emphasized by the following statement of Respondent-R; *"Hierarchy is useful. The advantage of more hierarchy and standardization is that everything is clear" (Respondent-R, Interview Business unit-R)*. Within the current organizational structure, formalization plays an important role in 'connecting' new employees. Formalization can help to get new employees up and running more quickly. It also helps with the implementation of new products/services. People can retrieve information faster. It therefore provides certain frameworks and helps with information needs. On contrary, the specialization is different for each function and is related to the complexity resulting from the market. According to Respondent-R, flexibility is important and is becoming increasingly important. Flexibility is related to responsibilities and decentralization because when decentralization places a lot of responsibility on the teams, a specific degree of flexibility is needed to meet the responsibilities *(Interview Business unit-R)*.

According to Respondent-R, the switch from a proposition that involved selling through business partners to offering services has a major impact on the ecosystem. It often happens that you, as an organization, adopt the changes in the market. Before starting anything, a business unit needs to identify needs, potential customers, turnover, problems and competition. After that, it is important to determine how differentiation will be created and for how long. On the basis of all this, it must ultimately be determined whether or not the step will be taken *(Respondent-R, Interview Business unit-R)*. When starting a new proposition, the business unit uses the Bowling Pin Principle. With this principle a minimum viable product is tested in the market to generate feedback. Everything about the product is discussed with a specific customer. In this way, the choices made are justified from the market. Based on this data the business unit needs to invest and grow. The business unit always starts with one specific market segment, after which both the product and the market segment are gradually expanded.

Finally, when choosing a suitable way to offer a subscription-based business model, Respondent-R would opt for separation from the current business unit. Disadvantages of integration have to do with the culture, mentality, but also with the commitment of the employees. Respondent-R states that; *"it is quite a switch to thinking from a subscription model. When separating, nobody thinks about the 'old' anymore. With separation, all legacy is left behind*". Furthermore, Respondent-R states that; *"in order to achieve success, people remain KEY! This is followed by strategy, market needs translation and perseverance" (Interview Business unit-R)*.

According to Respondent-R, companies active in today's markets can distinguish themselves in a negative sense by not offering the product as a service. When switching to subscription-based business model, the company takes responsibility for ensuring that the offering works. According to Respondent-R, it is crucial during this switch that there is a lot of communication about why the switch is being made. This cannot be repeated often enough because people quickly forget things and like to stay with the 'old' (Interview Business unit-R). As a result, many platforms and systems are used to communicate and store data, such as Confluence, WhatsApp, Workplace, Slack, Basecamp and Salesforce. Within the business unit many systems are used to communicate. However, there is still too little insight into how well or badly the business unit is performing. Nevertheless, just like the other business units, surveys are used to test employee satisfaction. Respondent-R admits that capturing all digital touchpoints with customers is something that is not yet done well.

4.2.5 Business unit-C

In addition to Business unit-R, Business unit-C can also be described as a semi-servitized business unit. The reason for this is that Business unit-C also brings two propositions to the market, including one based on a subscription model. The helpdesk within Business unit-C provides remote support.

However, due to the rise of modern technologies, the business unit was forced to reinvent itself. For these reasons the business unit underwent a reorganization with far-reaching consequences. After the reorganization it was decided to implement a flat organizational structure that actually consists of only three layers, namely managing director, team captains and team members. The technologies and the business unit were highly R&D driven. However, the choice was made not to do what the market asked, but to look at 'in which market and with which products do we want to be active' *(Interview Business unit-C)*. Within the flat organizational structure there are several disciplines (teams), these are Marketing, R&D, Product Management, Proposition Management, Sales and Operations, where sales can be further divided into Sales and Customer support (helpdesk). Within each discipline someone takes the lead. This has to be done because otherwise the span of control of the managing director will certainly become too big.

An advantage of the structure is that people can grow in the role of Team Captain. The disadvantage of this structure is that in reality there is little promotion. This disadvantage is mainly recognised by young people in the business unit. However, this is countered by the following statement of Respondent-C who states; "*I often see that people who are at Company-X, that's actually not where you get your satisfaction as an employee. People at Company-X who understand and appreciate the culture are no longer satisfied with promotion. They see how they can make a difference, how they can have an impact on what they do. And that's what gives you the satisfaction*" *(Interview Business unit-C)*.

Information and input for products and positioning should be obtained from the market. According to Respondent-C it is important to do a lot of sparring with the market and look for certain customers, segments or groups. In order to create an internal match, the business unit operates on the basis of certain core values that have been established by means of 'the golden circle'. As a result, there is a strong belief within the business unit that propositions should really contain the essence and as much complexity as possible should be removed. To make the transition a success, a lot of communication is needed. Communication is key! Above all, it must be explained WHY a certain strategy is being pursued and what it is intended to achieve. People need to understand why certain things are or are not being pursued *(Interview Business unit-C)*. Moreover, this is emphasized by the following statement of Respondent-C; "*communication, sharing, creates understanding whereby commitment comes intrinsically from the people themselves" (Interview Business unit-C)*.

The size of the group also plays a role in this respect. If the group is too large, everyone wants to express themselves and have input. If too much account is taken of everyone, this results in a monstrosity of a proposition. It is time consuming. For these reasons, "What really is the essence?" should be looked at from the start, with as little complexity as possible. Respondent-C states that a 'simple' proposition is much easier to scale and convey. It is important that the core values are taken into account in everything that is carried out. People understand things faster and pick it up faster if something is simple. That is a big advantage *(Interview Business unit-C)*.

Within the current organizational structure, employees are allowed to make decisions up to a certain level. However, Respondent-C states that the degree of specialization is related to the actual end product. The more specialized the product, the more specialism there will be in the business unit. This is emphasized with the following statement; "*in order to be able to make specialist equipment, we also need specialist knowledge*"*(Interview Business unit-C)*. Within the structure, flexibility is important because the market is volatile. Therefore, it is necessary to be able to quickly respond to the opportunities that arise in the market. In order to maintain flexibility, little is recorded within business unit C in the area of formalization. Many things are not made explicit because, according to Respondent-C, this is part of the responsibility of the employees, the culture and the level of communication.

The culture is related to the overall culture of Company-X, the market that is served and the strategy that is pursued. According to Respondent-C the culture can be described as informal in which there is room to show initiative and to take responsibility. Sharing stories should ensure synergy, commitment and good communication of information. This is emphasized by the following statement; *"it is an open culture in which it is easy to take a step. To stand up and do something, speak out and take the lead. In short, I would say it is a very informal culture in which there is a lot of steering and taking responsibility"(Interview Business unit-C)*. The infrastructure must ensure that the information is translated from the market. Awareness is created by visiting trade fairs, clients, symposiums or seminars. Internally, the team captains have periodic meetings to coordinate everything and share information. The CRM system takes care of recent and specific data. This way, choices can always be substantiated and scoring ratios are calculated. Moreover, the CRM-system is linked to current subscriptions and customer feedback.

When starting a new proposition, Respondent-C advises to opt for separation because this way the necessary culture, mindset and commitment can be formed without distraction or any form of legacy. Respondent-C also states that a separate group is more flexible. The people who have to work there have to carry and take responsibility, have to be smart and fast. When this is not the case, the organization may not be able to cope with the pace of the market.

4.2.6 Business unit-S

Unlike the other business units, Business unit-S is only active in the Dutch market. The business unit immediately started as a service organization and has not gone through a transition. For this reason, the services offered by the business unit are the same as the product delivered. When an organization or business unit decides to provide services, Respondent-S states that there should be contact with future customers right from the start. At the start of a proposition, employees will automatically take on multiple functions. As the organization grows, more people will be hired as the tasks become more specific. As a result, the organizational structure will automatically grow along with the overall growth.

Respondent-S states that as a result of the Company-X culture, a business unit should have as many people as possible in contact with its customers. Respondent-S states that; *"from day one, everyone should be willing to do anything. As the organization grows, tasks should be divided into responsibilities/disciplines"*. For these reasons, it was decided to divide the organizational structure within Business unit-S into small cells (team structure). Each cell has its own responsibilities and in order to meet these responsibilities the employees need to extract knowledge from the market *(Interview Business unit-S)*. As a result, Respondent-S states that the responsibilities and the knowledge from the market together determine how the organizational structure will be structured. This is emphasized by the following statement of Respondent-S, namely; "*the culture is partly formed by the general Company-X culture. But in the end everything, your structure, culture, starts with the market. The solution you want to offer, what your structure and further culture look like? It all starts with the market*" *(Interview Business unit-S)*. In short, the organizational structure design depends on the proposition, the customers and the market. In the eyes of Respondent-S, the most important thing is that the employees are in contact with the customers on which the proposition focuses. This creates a certain commitment between the customers and the company. Moreover, Respondent-S states that; *"In the end, everything starts with the market" (Interview Business unit-S)*.

Consequently, every week staff members sit together to share information. In addition, there is also monthly contact with the end customer to coordinate information/feedback. It is important to keep the customers close. This is done by placing a vlog or similar on social media/internet every week.

Within the teams there is decentralisation and little hierarchy. Respondent-S states that hierarchy will not work because hierarchy can ensure that arguments are won on the basis of the role rather than on the basis of substantive argumentation. As a result, Respondent-S states that when employees have a question employees simply dare to ask it. Furthermore, it is important that the vision and strategy are shared with everyone and that everyone understands why certain things are done. Sharing and explaining why certain choices are made also creates a certain commitment within the business unit. Within the current team structure, the view of multiple people is appreciated. It is important that others understand how a certain person looks at something. Respondent-S states that the worst thing that can happen in this structure is that it becomes hierarchical.

In terms of formalization, Respondent-S is convinced that this should be done as little as possible because standardization creates a rigid structure. The respondent does see the importance of documenting things, however, Respondent-S is convinced that there should be as little standardisation as possible. This is emphasized by the following quote, namely " *if you are going to standardize, you can almost ask yourself whether you should do it within Company-X? Because that almost means it is a rehearsal. And if it is a rehearsal, the added value is generally less and you could look for a business partner"(Interview Business unit-S)*. However, Respondent-H uses formalization and standardization in order to sketch frameworks, but no more than that.

According to Respondent-S, commitment is created by forming the mission, vision and strategy with everyone. Everyone needs to know what and how he or she can contribute to these aspects. This is emphasized by the following statement; "*it is best to make a strategy together and not communicate it. Especially in the initial phase passion and ambition are essential "(Respondent-S, Interview Business unit-S)*.Moreover, commitment from the market translates directly to the employees. Respondent-S also states that during the testing of the strategy and vision, the commitment of the employees is translated back into commitment from the market *(Interview Business unit-S)*. Moreover, once in a while the employees come together to discuss the vision, mission and strategy with each other. This is also to check whether everyone is aligned and to specifically define the role of the employee. This ensures commitment from day one! Basecamp is also a widely used platform to store information about customers and the market. This system is used because the business unit noticed that many discussions, which were already completed, came back.

When creating a new proposition, it is important to first create a certain vision together. This vision needs to be pitched and tested in the market. Based on the response obtained, adjustments can then be made. In this way, a proposition and corresponding plan are formed step by step. Like Respondent-R, Respondent-S also states that with a new proposition it is best to start with a minimum viable product that is developed on the basis of feedback. During this trial period, Business Unit-S asked its potential customers the following question; 'Suppose we want to make this product based on this vision, will you participate?'. In this way, the business unit was able to acquire customers before there was even a product. First of all, needs must be assessed before production can be started. If this is done the other way around, the business unit does not know exactly what needs to be made and whether the service fits the intended target group.

Results have shown that customers want/need a lot of guidance during the implementation process. In contrast to an on-premise business model, it is important in a SaaS model that when a deal is made, the customers are guided to the highest possible turnover. For this reason, a team has been set up within the business unit that specialises in assisting customers during the implementation process. There is also one contact person per customer within the organization. As a result of these adjustments, the business unit has gained more insight into how the product actually performs and is used.

4.2.7 Business unit-H

Similar to Business Unit-S, Business Unit-H is only active in the Dutch market. The interview showed that the business unit has implemented a pancake or pizza diagram structure. This means that the organization is divided into cells of different sizes consisting of 2 to 20 people. Each cell has either a task or product responsibility. According to Respondent-H, one of the biggest pitfalls is to apply control and grip. This translates into a decentralized organizational structure in which there is little or no hierarchical order.

With this structure, the managing director wants to ensure that the teams remain small and close to their users. Actually, that is the core. However, this model also has disadvantages. An advantage of this model is that the business unit can develop nicely in parallel because each team has its own capacity and their own pace. Respondent-H states that the development power that emerges from this is very great because dependencies are partly removed. For example, in the form of allocation of capacity. Each team has its own development capacity, so the teams decide for themselves without having to cede capacity to other teams or having to discuss their course for next year. The disadvantage of this structure is that the dependencies are simply greater. So it requires more flexibility and more alignment. That is why Respondent-H thinks that it is also less efficient and maybe even less effective. Perhaps even a bit more expensive than a more traditional structure *(Interview Business unit-H)*. However, Respondent-H states that due to this pizza structure some really great solutions on a team level have been realized. Thus, the pizza structure is seen as a very powerful model that fits Company-X because, according to Respondent-H, Company-X stands for high quality colleagues.

Within the pizza structure the captain's principle is applied. In short, this principle implies that each cell has a captain who is responsible for one or more teams. A captain can be seen as a kind of informal leader who, like a captain in football, is equal to his teammates but sets the lines. However, Respondent-H concludes that as teams grow larger it becomes increasingly difficult to perform their own tasks. So the amount of work associated with their role as captain is getting too big. As indicated, each cell bears its own responsibility. This applies both in terms of retrieving information from customers and in terms of retrieving market information. Thus, it is stated that the teams have a high degree of autonomy in which management is 'killing'. For this reason there is a low level of formalization within the business unit. The teams are responsible for their own information, product and customers. Therefore, the most important element of this structure is communication, sharing stories, ideas and progression. This is achieved through multiple sessions, both with the captain and with other teams. Once every x number of weeks the teams meet with business partners and end users to give and receive feedback.

The business unit more or less uses the Self Determination Theory as a guiding theory. The Self Determination Theory stands for Autonomy, Competence, and Relatedness. However, as an organization Trust is added as a fourth core value. These core values ensure that a high level of synergy and commitment is created within the business units. At the same time, these core values are involved in every choice to be made. Everything has to be reasoned from the core values. However, within this structure, the people are the most important asset. This is emphasized by the following statement of Respondent-H who states that; "*if you cannot get a club of quality people to commit to you, I would not start soon. Very good people is key! Convince people why you want to do things in order to reduce resistance. To make a change in the organizational structure successful it is important to have the people with you. If you do not get the people with you, it just will not work*" *(Interview Business unit-H).*

Due to the growth of the department and the degree of complexity, the demand for specialization continues to grow. Within this structure, responsibilities, specialization, and communication are related to market translation, core values, and the prevailing culture. The factor that connects this coherence is people. According to Respondent-H, the people ensure that the structure and the culture are formed and remain successful. This is emphasized by the following statement; *"the people are responsible for the culture within a business unit" (Interview Business unit-H)*.

4.3 Cross case analysis

Within the following paragraphs, the results regarding cross case analysis of the structural organizational dimensions will be elaborated. First of all, the (de)centralization dimension will be dealt with. In addition, the dimensions departmentalization, formalization, hierarchy, responsibilities and specialization are elaborated on the basis of the data analysis results.

4.3.1 "Pizza" structure

In general, within Company-X a 'Pizza structure' is applied. At first, this means that within all business units the strategy and vision are determined with the whole business unit, or with a selective part of it, because "*at Company-X it always starts with people, then technology*" (Respondent-I, Interview Business unit-I). Subsequently, the organization is divided into different teams/cells, each responsible for a certain part of the organization. This can be one for a product, service, task related to the offering, or a discipline like marketing. In addition, the captain's principle is applied. In short, this means that each team has a team captains/ team leader who is responsible for one or more teams. Respondent-H states that the team captain; "*is a kind of informal leader who, just like a captain in football, actually sets the lines but is equal to his teammates" (Interview Business unit-H).* In some occasions, the teams are split up into different sub-teams, with each their own team captain. In general organizational structures within Company-X consist of four layers. Employees of Company-X are either a team member, team captain, alignment member or managing director. The alignment members are responsible for the communication, keeping direction of the strategy and vision and outline frameworks for quality. Next to that, the alignment members must ensure that there is synergy between all the teams at home and abroad. However, the most important task of the alignment team is to stimulate cooperation and facilitate cross-functional connections between the teams. In addition, alignment members within Business unit-R not only outline the frameworks for quality but also outline the appearance of a product/service. In short, within Company-X a flat organizational structure is used which consists of a maximum of four different layers.

4.3.2 (De)Centralization

(De)Centralization refers to the hierarchical level that has decision-making authority (Daft et al., 2014; Mintzberg, 1979b; Robbins & Coulter, 2015). When decision-making is kept at the highest level of the organization, the organization is centralized. On contrary, when decisions are delegated to lower levels of the organization it is decentralized (Daft et al., 2014; Mintzberg, 1979b; Robbins & Coulter, 2015).

During the descriptions of the business units, it was asked how important (de)centralization was in regard with servitization success. Although the view on (de)centralization is generally similar, there were differences with regard to the associations and rationale behind the (de)centralization of business units. From the respondents perspective, decisions should be transferred to the lower levels of the organization, because as Respondent-L states; "*at Company-X we have a high degree of freedom to do business" (Respondent-L)* and; "*we like to develop people and stand for high-quality colleagues" (Respondent-Y).* These quotes contribute to the fact that the respondents have a high degree of trust in the capabilities of the employees. Based on this trust, respondents state that employees are capable of making decisions that contribute to the determined strategy and vision. Nonetheless, these are not the only reasons why decentralization is applied. Respondent-S applies decentralization within its business unit because of the predominant cultural aspect that within Company-X as many employees as possible should be in contact with the market and the customers. This is underlined by the respondent with the following quote;

"*You want as many people as possible to talk to customers/the market*" *(Respondent-S, Interview Business unit-S).*

In addition, Respondent-R confirms the statement of Respondent-S and elaborates on what should and should not be decided centrally. According to Respondent-R, what you want to achieve and who you want to be in the market should be decided centrally. The how, so how you do things, should be decided in the teams. This is emphasized with the following quote;

"*Ultimately what you want to achieve, who you want to be in the market. That is what you determine centrally. The how, how you do things, that is what you determine in the teams" (Respondent-R, Interview Business unit-R).*

Whenever these kind of decisions are made it is communicated to the teams separately. From this point on, the decision-making power is transferred to the individual teams and the team members. In addition, large changes or adaptations are discussed with a larger team, because of the potential overall impact of these decisions. The people who are working in the different business units are ultimately able to make his or her decisions as well as possible, actually independent. Moving the decision-making authority to the lower levels within organizations is also called vertical decentralization. The rationale behind this statement is that employees are closer to the market and in a better position to translate the complexity of the requested market needs into solutions that contribute both to the overall vision and strategy as well as to the required customer wants and needs. However, Respondent-I mentions that there is a difference between centralization and decision-making power. As a result, Respondent-I states that; "*at the end of the day, everyone in his or her own capacity is empowered to make decisions up to a certain level" (Interview Business unit-I)*.

Within Company-X there is a strong belief that the people know what is best in order to please the customer or to deliver a certain quality worldwide. The best summarizing reasoning behind the reason to apply decentralization is given by Respondent-R, who states that; "*we want to avoid that decisions are NOT made. There are things whose impact is so great that the teams cannot decide at all, or does not want to decide. In principle, the team decides everything unless they cannot decide it. Each team has its own area of responsibility."(Interview Business unit-R).*

In short, Company X's employees are able to make decisions up to a certain level. When this level is met, the decision must be made by an employee of a 'higher' level, most often the team captain or alignment member. In general, the employees have the authority to make decisions concerning day-to-day operations. If this decision-making authority is not decentralized, the team captain will most likely be overwhelmed with decisions still to be made, due to the flat organizational structure. This will eventually lead to a bottleneck regarding information and decisions in the organization, as a result of which any decisions will be taken too late or not at all. It will also take the team captains of alignment members a lot of time to make an appropriate decision due to the lack of detail in the information. The delay in decision making is one of the signs of structural deficiency (Daft et al., 2014).

4.3.3 Departmentalization

Departmentalization is the way in which shared tasks are combined and assigned to working groups. Tasks can be combined in departments based on function, process, product or service, customer and geographical location (Mintzberg, 1979b; Robbins & Coulter, 2015). The results have shown that in order to achieve success during servitization, the organizational structure must be divided into small cells with a specific task or product responsibility. This responsibility will require employees to acquire knowledge from the market. Departmentalization is related by the respondents to growth based on needs arising from the market. The analysis shows that there is a difference in the method of departmentalization and the phase of the business unit concerning the servitization process. This depends off the propositions and the markets in which the business units are active. This statement is supported by Respondent-Y with the following statement; "*so the product has partly determined the organization as well. And the product is again a result of market demand"(Interview Business unit-Y)*.

When there is little or no servitization, at first glance there is departmentalization based on function. As a result, the most common departments are Sales, Propositions, Marketing, Operations, R&D and Support.

Nonetheless, when further zooming in on this structure, departmentalization based on geography, process, and product also takes place. A common separation takes place within the R&D, Sales and Operations related teams. These teams are often further subdivided based on the required knowledge and market complexity related to the various propositions. Furthermore, the result shows that within the R&D teams a distinction is often made between software and hardware because the differences and the importance of software-related aspects are increasing. This form of departmentalization is therefore based on product. The following quote from Respondent-L emphasizes departmentalization within R&D in which responsibility also plays an important role, namely; "*within the R&D circle you have small sub-teams that each have a different discipline, but in total are able to prepare an entire product part of the proposition*" *(Interview Business unit-L)*.

Within the business units that are not or hardly servitized, it is notable that in addition to departmentalization on the basis of function, the sales and support teams are departmentalized on the basis of geographical location. The purpose of this is to better meet the local needs of customers and to ensure that local legislation can be met. These geographically remote teams often report to an alignment member or to the team captain of Sales. These are responsible for the execution of the strategy, vision and quality assurance. However, an exception has been made at Business unit-Y. Here, in addition to departmentalization on the basis of geography, the choice was made to also differentiate on the basis of Customers. For example, a number of teams and tasks are dedicated to Multinational Customers. These are clients who need more help and need more specific attention with the global rollout of the systems. This method of departmentalization results in more resources being allocated to meet the needs of the customers. In addition, processes can be focused on the problems that occur more than once during the rollout in question. As a result, specialization is created within the department. This specialism can then be applied to any global rollout.

Compared to the non-servitized business units, the semi-servitized business units bring both a hardware and a software proposition to the market. Because these groups operate internationally, departmentalization based on geography and product is applied in addition to departmentalization based on function. Geographical departmentalization is being done in order to better meet local needs, however, a uniform quality must be achieved. Local legislation also plays a major role here. Obviously, every product/service must comply with this legislation. According to Respondent-R, companies active in today's markets can distinguish themselves in a negative sense by not offering the product as a service. This is supported by the following quote of Respondent-R, namely; "*a company can only distinguish itself in a negative sense by not offering the product as a service. In many markets, you cannot escape it by offering something in the cloud" (Interview Business unit-R)*. As a result, business models are adapted to meet the needs of the market. Within the semi-servitized business units, the biggest transition had to take place within the R&D related teams because, as Respondent-R and Respondent-C describe it; "*your R&D department has to change completely from 'I deliver a product' to 'I have to deliver a product that always works'. The mindset has to be changed whereby we say 'in that market we want to play a role with our own products" (Interviews Business units-R and -C)*. Based on this philosophy, the department then looks at the way in which tasks should be divided and/or combined without creating confusion within the department. First, a clear distinction is created based on the hardware and software propositions. However, what is striking about this division is that the capacities of the marketing team within Business unit-R are used for both propositions. The reason behind a joint marketing team concerns the workload. However, there is not yet enough work to make a clear separation. Moreover, the marketing team mainly focuses on trade fairs where Business unit-R is presented as one brand. At trade fairs, Business unit-R almost always presents both propositions. Furthermore, within the Business unit-R, there is a clear separation between the propositions. For example, there is a Sales team for the hardware proposition and a Sales team for the software proposition. At Business unit-C a distinction is also made on the basis of Product or Service. However, due to the reorganization that has taken place, the team capacities of Marketing, Operations and Controlling are utilized for both propositions. This has mainly to do with the size of the total business unit and the daily workload.

Unlike the business units discussed earlier, the fully servitized business units are not departmentalized on the basis of geography, due to the fact that both business units are only active for the Dutch market. On contrary, both business units are departmentalized from the belief that as many employees as possible should be in contact with the people to whom you provide the service. This is supported by the following quotes;

“What is most important to me is that everyone has contact with the one client you are doing it for” (Respondent-S, Interview Business unit-S).

“What we wanted with this structure is that teams stay small and close to their users. Actually, that is the core.” (Respondent-H, Interview Business unit-H)

As a result of this ideology, both departments have been departmentalized on the basis of responsibilities and divided into teams varying from two to twenty people. These responsibilities ensure that the teams have to extract the necessary knowledge from the market. However, according to the respondents, there is also a certain difficulty because the responsibility is determined by the knowledge needed from the market. However, the need for knowledge is again determined by how the market works. In the end, this, in turn, determines the organizational structure. According to Respondent-S the topics knowledge need, responsibility, market knowledge and organizational structure are related to each other. This is emphasized by the following statement;

“*I think that is the most difficult part of the process right now. You can pick up information about organizational structures from other business units, however, that will very much depend on what your proposition, your customers and your market look like” (Interview Business unit-S).*

An advantage of departmentalization based on responsibilities is that each team has its own capacity and its own pace, which means that the development force that is created is very high because dependencies are partly eliminated. Thus, *"each team has its own development capacity so teams can decide for themselves without having to cede capacity to other teams or having to discuss their course for the next year" (Respondent-H, Interview Business unit-H)*.

An important point of attention in departmentalization based on responsibilities, in combination with an 'as a service' business model, is that; *"once the deal is made, it is essential that those customers are guided to a lot of turnover" (Respondent-S, Interview Business unit-S)*. The teams will constantly have to translate the needs of the customers and steer them towards higher turnover because the amount of turnover of the business unit will depend on the number of users of the different applications and possible software packages. With the following statement, Respondent-S emphasizes the trajectory that departments that start with an 'as a service' business model go through regarding departmentalization;

“I think from day one you have to be willing to do anything, and as you get bigger you're going to divide that into responsibilities. You have to take the information for your product out of the market. At the end that translates into a desired organizational structure. In the end, the market and the solution you want to offer determine what your structure and further culture looks like” (Respondent-S, Interview Business unit-S).

In short, departmentalization in the business units that are fully servitized is based entirely on responsibilities arising from market and customer needs. These needs ultimately translate into how the organizational structure and culture will look like. However, when the business units go international, alignment is needed so that globally the same quality can be delivered. The alignment members and departmentalization based on geography play an important role in this. Ultimately, however, departmentalization based on customers can also be applied when it appears that a specific group of customers are experiencing the same problems, as is the case with Business unit-Y. In order to be successful with the organizational structure, the organization needs to look at the needs of the market and the current offerings. Based on this information a choice has to be made based on function, customer or product. When the group has an international orientation, a more specific departmentalization will have to take place within the teams on the basis of geography. Ultimately, it is all about the teams translating the needs of the market into usable, suitable services that fit the market needs and excel in ease of use.

4.3.4 Formalization

Formalization is the reliance on written documentation in the organization. This documentation covers procedures, job descriptions, regulations and policy manuals. In other words, to what extent are the rules, procedures, instructions and communication written and to which extend is the behaviour of employees guided by rules and procedures? (Daft et al., 2014; Robbins & Coulter, 2015).

In general, the results in terms of formalization are the same for all business units. There are no major differences between the non-, semi-, fully servitized departments. According to Respondent-I formalization of processes should be done on the basis of position and persons, because formalization can help in making progress. *“People first, then technology” (Respondent-I, Interview Business unit-I)*. In general, companies do not want to constantly fall back or go back on previous decisions. Ultimately, companies need to be able to build on these decisions. That is why a balance has to be found between sufficient and too much formalization. However, formalization should not stand in the way of progress or, as Respondent-I states, *"it should not become a goal in itself"*. Formalization should be a means to eventually work together in a good way in the interest of the customers.

In formalization, it is important that things are good and clear to one another. Formalization is related to the size and growth of the business unit. As aforementioned, there is a high degree of freedom to do business within Company-X. However, that freedom goes along with responsibility. Employees must be able to deal with this freedom. In that respect, some employees need clarity in which expectations are created. This is also evident from the following statement; “*It is more to clarify what is expected of certain people. How things work, how things do not work.” (Respondent-L, Interview Business unit-L)*. According to the respondents, formalization can help to fill in the expectation patterns. As an example, Business unit-L worked on a book on the subject *'how does it actually work at Company-X?'*. This book was created because Respondent-L and several employees noticed that due to the growth of the business unit, the automatic transfer of knowledge and skills went less smoothly and in a less natural way. The documentation, the book, helps to create frameworks so that a certain quality can be guaranteed. However, this documentation also includes simple things like *"where do I get notebooks?"*. Normal things that employees will not directly ask colleagues in advance.

In addition, formalization mainly relates to compliance. It has been noted within various business units that the quality currently depends too much on how specific individuals fill in certain things. In this way, there is no quality standard that can be used as a guide. Formalization should mainly ensure that it is recorded 'how' certain things should be done in order to achieve a quality standard, such as ISO standards. This is in line with Respondent-Y's statement that formalization should be used *"to outline standard frameworks with the objective of ensuring quality" (Interview Business unit-Y)*. Formalization should be 'light-footed' in nature. Otherwise, it is at the expense of flexibility. The aforementioned balance and frameworks should ensure that quality is not too dependent on certain individuals.

Unlike the other business units, formalization plays an important role within Business unit-R because of their experience that procedures and manuals are important when connecting new employees. This is in line with Respondent-L's reasons for creating the book. In the eyes of Respondent-R, standardization has the great advantage that new employees can find what a certain team is working on much faster. This is also evident from the following quote; *"The advantage of more hierarchy and standardization is that everything is clear" (Respondent-R, Interview Business unit-R)*.

Contrary to Respondent-R, Respondent-C admits that, in his view, formalization is not so important and that a lot is done informally. Within Business unit-C, matters concerning formalization are not explicitly recorded. Respondent-C states that formalization is related to the responsibility of the employees, the culture and the level of communication. This corresponds with the way of thinking of Respondent-S who states that one should do as little as possible because standardization ensures a rigid structure. However, Respondent-S is of the opinion that certain things need to be defined in order to achieve a quality standard. A risk of the rigid structure may be that employees only perform tasks that are related to the job description. For these reasons, Respondent-S' opinion is that there should be a limited degree of standardization within the organization. This opinion is supported by the following statement; *"if you are going to standardize, you can almost ask yourself whether you should do it within Company-X? Because that almost means it is a rehearsal. And if it is a rehearsal, the added value is generally less and you could look for a business partner"(Interview Business unit-S)*. However, Respondent-S' opinion is that standardization should be used to outline frameworks, no more than that.

The vision on formalization of Respondent-H corresponds with the vision of Respondent-S and Respondent-C. Indeed, Respondent-H states that low formalization is applied within Business unit-H because the teams themselves are responsible for the information, product and customers. Particular emphasis is placed on the core value of Autonomy, which originates from the Self Determination Theory. Respondent-H states that; *"one of the biggest pitfalls is that you want to apply control and grip. So to start asking for lists, to start asking for reports etcetera. Because people feel they have to answer for something they know, but you do not. You also take away a part of the autonomy" (Interview Business unit-H)*.

In short, formalization is related to the size of a group. When it is noticed that the groups become too big, formalization is a good way to outline frameworks for quality, but also to work together in a good way. Formalization can help to monitor and generate progress. However, a balance needs to be found between the right amount of formalization/standardization. One of the most important tasks of formalization is that it creates transparency and clarity for the employees. Formalization helps in the (automatic) transfer of knowledge and in the fulfilment of expectations. All respondents agree that formalization should be used to outline quality frameworks, but that it should not get in the way of employees' freedom. Employees should still be able to carry out activities that are related to the responsibilities and freedom arising from the general corporate culture.

4.3.5 Hierarchy (of authority)

Hierarchy (of authority) describes who reports to whom and the span of control. Hierarchy of authority is related to the span of control, the chain of command, and configuration (Daft et al., 2014; Mintzberg, 1979b; Pugh et al., 1968). Analysis has shown that hierarchy is related to the way of organizing centralization, departmentalization, culture and people. Within Company-X the decision-making power is decentralized, partly due to the combination of the flat organizational structure, the team structure and the application of the captains principle, there is little hierarchy within Company-X. However, as Respondent-I says; "*everyone has a limited span of control, no matter how wise or clever you are." (Interview Business unit-I)*. Basically, all teams have a team leader or captain. These teams can be subdivided into smaller sub-teams, with each team having a final manager appointed by the team itself. Therefore it is possible that there are several sub-team captains under, for example, the team captain hardware. Ultimately, the number of sub-teams within a team determines who reports to whom.

However, an exception was made at Business unit-R. Within that business unit, more hierarchy was deliberately applied. The reason for this is that the managing director noticed that as the organization grows, and certainly when several teams grow abroad, it becomes increasingly difficult to keep each other informed. When the business unit has several overseas offices, hierarchy is useful. The advantage of hierarchy in combination with standardization is that it clarifies things for everyone. It speeds up the process of discovering what is going on within the business unit and who is responsible for what. Or as Respondent-R says; *"otherwise it takes a year to discover 'what am I actually doing here? What exactly is this team doing? What are you doing?" (Interview Business unit-R)*.

The other results showed that little or no hierarchy is applied. Instead, there are different disciplines within the business units. Within each discipline, one particular employee takes the lead. For example, within a team such as sales there should be a team captain. When this is not the case with large groups, the span of control of the managing director becomes too large. According to Respondents-S and -H, applying hierarchy is the worst thing a managing director can do because hierarchy can ensure that employees win arguments based on their role and not on substantive arguments. What is important is that a framework of principles is created along which employees can make their choices. Autonomy is important because responsibilities are much more at the team level.

In short, within the different business units there is a clear view on hierarchy. As a result of the organizational structure, the freedom, decentralization and the manner of departmentalization, not every person is suitable to work at Company-X. As Respondent-Y states; *"this can only work if you have good people. People who fit into the system. A lot of people do not fit in this system" (Interview Business unit-Y)*. To be successful with servitization, the organizational structure must be as non-hierarchical as possible. If this is not the case, employees will win discussions based on their position in the organization rather than on substantive arguments. Hierarchy also affects the level of responsibilities, which are now very much at team level. Within the teams, reporting takes place in an informal setting. Although this can differ per team. The captains need to assess which people are in the team. Based on this a reporting structure needs to be developed that suits the team members. Within Company-X the team captains have the freedom to fill this out for themselves. However, when the business unit operates internationally, hierarchy, in combination with standardization, can be useful in clarifying tasks, responsibilities and information sharing.

4.3.6 Responsibilities

Responsibilities are defined as an authoritative position about having someone, the duty to make sure that certain things are done, and refers to the way in which responsibilities within organizations and teams are divided and organized (Daft et al., 2014; Robbins & Coulter, 2015). When companies decide to provide a product-service offering, those companies take full responsibility that the product-service offering will always work. Updates will be carried out without the customer asking for them. However, this is because the company bears the responsibility for the continued functioning of the product-service offering. For these reasons, responsibility plays an important role within servitizing companies.

Results have shown that responsibility plays a major role within the current organizational structures of the business units. In combination with decentralization and the team structure, the teams are charged with a high degree of responsibility. Due to the structure, the team members are close to the market. An important reason for this is that the team members can better determine what needs to be done to apply improvements (performance enablers) in order to achieve success, as well as to obtain feedback on performance to resolve any problems at an early stage. The following quote from Respondent-R also highlights this, stating that; “*the how, how you do things, that's what you determine in the teams. So I'm not going to tell Hank how to please those customers. That's up to him. And if he has 6 customers, he has to start thinking about how he does that in case he gets 6 customers” (Interview Business unit-R)*.

Within Business unit-I, the alignment members are responsible for communicating the full strategic direction of the business unit to the various teams. It is not the intention that the employees constantly communicate with each other in order to stay up to date regarding the strategic direction. As indicated by decentralization, the teams have their own decision-making power up to a certain level and the respondents want to avoid decisions not being taken. If the teams cannot or do not want to take the decision in question, the team captains should involve the alignment members or the managing director. For these reasons, the alignment members play an important role with regard to the overall synergy within the business units, especially within business units who have multiple international offices.

Respondent-I states that in order for a change in the organizational structure to succeed, employees must be given responsibility and trust from within the organization. Also, employees should feel safe enough to make mistakes. According to Respondent-I, these are the basic conditions that are important with regard to responsibility within the teams. Communication is important, but ultimately also achieving results. Every team has its own responsibilities and carries these responsibilities. Within the teams, it is important that the team members show initiative related to the responsibilities. This is emphasized by the following statement of Respondent-Y, who states; "*should new responsibilities arise, then the employees will automatically find someone who feels responsible and forms a team to solve it*"*(Interview Business unit-Y)*. In addition, Respondent-Y admits that this is the romanticized version of reality, but that this ideal image is pursued within the business units. Nevertheless, choosing the right person is a team responsibility and this responsibility does not lie with just one person. According to the respondents, the team captain is responsible for ensuring that everyone in the team knows his or her responsibilities correctly.

Furthermore, the results showed that communicating, debating, allowing people to give input, thinking along with people and addressing their responsibilities go hand in hand with a change in the organizational structure. As Respondent-C states; *"it is, of course, the responsibility of all of us to survive, and reinvent ourselves" (Interview Business unit-C)*. In order to achieve success, it is important that the teams extract information for the offering from the market. As a result of the flat organizational structure, the application of the captains principle, and the vertical decentralization, team members have the freedom and responsibility to continuously make their own decisions. This is also emphasized in the following quote from Respondent-H, which states that *"people in the teams can continue to make their own choices. The moment a captain says 'I think you should do that 'then the people in the teams can still say 'its fine that you say that, but I choose a different direction'. The responsibilities are much more at team level"*.

In other words, in order to be successful with servitization, responsibilities at team level need to be divided by the team captain. In doing so, the captain must respect the general Company-X culture and ensure that the appropriate people are placed in the right teams. The alignment members play an important role in translating the strategy and vision towards the teams. In addition, the alignment members are charged with the responsibility to facilitate synergy between teams. Moreover, the alignment members are responsible for the establishment of frameworks to guarantee a set quality. When the teams cannot decide or when the teams feel that the choice will have a greater impact that suits their responsibilities, the alignment members and/or the managing director are called in. However, one of the most important aspects for all this to succeed is having the right people to deal with the responsibilities and freedoms. The final responsibility to find the right people lies with the team captains and the managing directors. However, the teams are ultimately responsible for a product or a task related to the offering. Moreover, within Company-X there is a high degree of autonomy which contributes to the overall success of the company.

4.3.7 Specialization

Specialization is the extent to which organizational tasks are subdivided into individual functions. If the specialization is extended, each employee only performs a limited number of tasks (Daft et al., 2014; Galbraith, 2002; Mintzberg, 1979b; Pugh et al., 1968; Robbins & Coulter, 2015). The results have shown that in order to be successful during servitization, the organizational structure needs to be specialized up to a certain level. However, it is not clear up to which level this is because this differs per business unit.

Analysis shows that within Company-X tasks are assigned on a team level. Within the teams, tasks are further subdivided among the employees. The specialization within these teams comes from the translation of market needs in combination with team responsibility. As Respondent-Y states; "*this is also a translation of the degree of complexity. You are going to need a lot of specialty to make this work*". The product-service offerings that the business units bring to the market are a translation of the complex market needs, whereby higher demands lead to complexity and specialism.

According to Respondent-I, it is logical that specialists have to excel in their field. However, it is not only about the specialists but "*it is about the connection between specialists*" *(Respondent-I, Interview Business unit-I)*. Sometimes a generalist is needed to make sure that the specializations are connected in a correct way. Nonetheless, if this is not the case, a mismatch may arise between market demand and the offering, creating a 'gap' which may result in customers choosing the competitor's offering. A mismatch regarding the connection between the specialists can also cause the internal focus to diminish, ultimately reducing productivity. This corresponds with the indicators of an effective or ineffective organization by Cunningham (1977) and Daft et al. (2014).

Furthermore, analysis has shown that the specialization depends on the type of work an employee performs in the organization. Employees with a somewhat more managerial position generally have a broader perspective and in that respect are more generalists than specialists. This is emphasized by the following quotes; "*I think that if you look at the development department, there are relatively more specialists there. In short, it depends on the type of job you do in the organization. When you look at the people who have a somewhat more managerial position, they generally have a somewhat broader perspective and they are more generalists in that respect than just specialists" (Respondent-L, Interview Business unit-L).* Or as Respondent-R emphasizes; "*the specialization differs per function and is related to the complexity resulting from the market*"*(Interview Business unit-R)*.

Contrasting to the other respondents, Respondent-C has a more practical view on specialization, namely; "*in order to be able to make specialist equipment, we also need specialist knowledge*"*(Interview Business unit-C)*. This statement is in line with the fact that the respondents refer to the origin of specialization, namely market demand. Within the current organizational structure and the associated responsibilities, the business units are active in complex markets. However, whenever it is noted that a certain specialism is required, the team members and team captains themselves must ensure that this required capacity is filled or supplemented. Respondent-R emphasizes this fact with the following statement, namely; "*within each team, each member has his or her specific tasks for which they are responsible. If a problem arises within the teams, they solve it themselves. The teams look at the available capacity and where necessary they ask for help." (Interview Business unit-R)*.

In addition, results also showed that specialization is related to the growth and scale on which the business units operate. The larger the business unit, the more specialized the work per function is. As a result of the growth of the business units, relatively more specialists have been hired, because the tasks and products increasingly demand specialist knowledge. The growth of the business units has also led to more and more specialized questions, both market-driven and internally driven with a higher degree of complexity. This is emphasized by the following statement; "*as a result of the growth, we have attracted more specialists. The scale on which we work is simply so much bigger than 5 years ago. That is why we need more specialists in the field of performance, security and privacy." (Respondent-H, Interview Business unit-H)*.

In brief, the degree of specialization is determined by the complexity resulting from market demand and the product-service offering that has been developed. Not only the complexity determines the required degree of specialization, but also the function and discipline of the employees. In general, employees with a more management-focused function will perform less specialized tasks than employees who are responsible for a specific niche such as User Experience related to a certain type of client such as Multinational Customers. *"To make a success of something, you have to pay attention to it" (Respondent-I,* *Interview Business unit-I)*. The combination of specialization and responsibility means that Company-X's employees do not only perform a limited number of tasks. The employees are responsible for a certain part of a product or a specific part of the business. Therefore, the employees have the freedom to decide how the associated activities will be carried out. It is not possible to make a single statement about the degree of specialization in order to achieve success, because in general within Company-X each team determines the required degree of specialization by itself. The high degree of autonomy in operational tasks continues to play an important role in the extent to which tasks are divided into separate functions.

4.4 General conditions for success

During the interviews and the case analysis, in addition to the structural dimensions, the respondents dealt with various factors that we believe contribute to the success of a business unit. Factors discussed included culture, commitment, (cross-functional) communication, flexibility, infrastructure and synergy. A number of theories have also been identified that the respondents believe can contribute to the overall success of a business unit. A number of the theories, such as the Self Determination Theory, have already been briefly discussed in previous sections.

4.4.1 Strategy and vision

The results have shown that in order to achieve success, the strategy, mission and vision must be formed with as many employees as possible, i.e. with everyone or a select group of key players. Further decisions need to be made based on the philosophy of the established mission, vision and strategy. Ultimately, the employees should monitor the direction of the organization. While translating the market needs, strategy, mission and vision should be used as a guideline resulting in a 'fit' between supply and demand. To generate this fit, strategy, mission and vision must first be tested in the target market. On the basis of the feedback, adjustments can be made. However, what ultimately needs to be done must be determined afterwards.

In addition, it is important for the organization to identify potential customers, turnover, problems and competition before an offer is presented to the market. Moreover, it is important that it is determined how the organization will distinguish itself and for how long this is possible. On the basis of this information, a minimum viable product should be developed. In addition, the minimum viable product has to be launched into the market in order to test the offering and generate feedback. Results have shown that the market plays an enormous role in the development of new products, services and propositions. Therefore, it is essential to think from a customer's needs perspective. For example, the question *"what does the customer need?"* should be addressed. Such a question should be the starting point for the development of new propositions (Respondent-I, Interview Business unit-I). Moreover, Respondent-R states that organizations adopt changes in the market. *"As an organization, you are constantly active in the market and then adapting the organization. What is important is that not everything should always be up for discussion"(Respondent-R, Interview Business unit-R)*. Too much discussion can lead to frustration regarding strategic choices or direction, ultimately leading to resistance. Discussions can also lead to decisions not being taken or being taken too late. However, in line with the statements of Respondent-I, when the right people are in the right place in the organization, the organization is able to bundle insights from different perspectives so that a complete picture can be formed. The disadvantage of collecting these perspectives is that it can be time-consuming, which slows down the decision-making process because information from different perspectives has to be bundled constantly (Respondent-I, Interview Business unit-I).

According to the respondents, composing the strategy, mission and vision together ensures that employees are committed to the strategic direction of the organization from the start. Therefore, it is important that employees know what and how it is possible for them to contribute to the vision and strategic goals. Respondent-L states that; *"commitment comes from the vision and strategy, especially from the belief in this vision and strategy" (Interview Business unit-L)*. Furthermore, it is also important that people get information from the market and solutions are reasoned from the market's perspective. According to the respondents, this reasoning method creates a certain commitment within the group. According to

Respondent-S, the commitment of the employees is translated into commitment from the market while testing the strategy and vision. Respondent-I states that; *"there is nothing stronger than a 'commonly defined goal' argued from the market" (Interview Business unit-I)*. The defined goal ultimately contributes to the overall commitment and synergy between different teams. Once the goals have been formulated, it is of importance for the managing director, the alignment members and the team captains to communicate the vision and strategy. The key here is that not only the employees should have the feeling that it is the right direction for the organization, but also the customers have to have the feeling that the chosen direction is the right one.

4.4.2 Communication

Analysis shows that the most important element related to the organizational structure is communication. The results showed that communication is key during a transition. Communication includes the sharing of stories, ideas and progress. Sharing stories should ensure synergy between teams, commitment and good communication flow. Story sharing takes place through multiple recurring sessions in which both the captains and several teams participate. In order to achieve a positive result during a transition or change, it is important that the managing director communicates the vision. When communicating a change, employees should be informed as early as possible on why choices have or have not been made. According to the respondents, it is crucial that employees understand the reasoning behind the choices and the change in strategy and vision. The following statement by Respondent-C clarifies the tasks of the managing director, the alignment members and the team captains towards the employees, namely; *"communicating, debating, giving people input, thinking along with them, addressing their responsibilities" (Respondent-C, Interview Business unit-C).* The manager plays an important part in this because if the 'top' does not see that anything needs to be changed, the employees will not be successful either. This emphasizes the fact that it is important to have the right people in the right positions in the organization in order for a change to succeed.

People have a resistance to change by nature, but if there is commitment, people will work on the things that are needed to make the change work. Moreover, it is of importance that people understand the perspectives of others. Respondent-R's following statement emphasizes this, namely; *"communication is key! Especially the why is important, what you want to achieve, why a certain strategy is followed. People need to understand why certain things are done and not done. During a transition, it should be explained as often as possible because people quickly forget things" (Interview Business unit-R)*. According to Respondent-Y, culture, decentralization and forming the direction and vision together will result in employees showing more initiative. However, according to Respondent-Y, everything starts with commitment because; "*if you do not have a commitment then you get nowhere. Above all, you have to have commitment. That starts of course with the vision and strategy." (Interview Business unit-Y)*. Moreover, Respondent-C states that; "*communication, sharing, creates understanding whereby commitment comes intrinsically from the people themselves" (Interview Business unit-C).* This statement emphasizes once again that people are one of the, if not the most important, assets for achieving success.

4.4.3 Infrastructure

Furthermore, analysis has shown that communication is strongly related to the infrastructure of a business unit. The infrastructure must ensure that information is collected from the market and then translated into usable input. This involves using multiple infrastructure systems and processes that help streamline related processes so that feedback can be given on the basis of user data. The ultimate goal is to improve performance and simplify processes based on user data.

The results have shown that information sharing helps to generate and strengthen synergy. As a result of the synergy generation, a large part of the infrastructure is focused on sharing stories. According to the respondents, story sharing is the most important thing within an organization. Therefore, the infrastructure needs to support communication sharing well. As a result, there are several internal periodic meetings that focus mainly on communicating information, both from an internal and external perspective. A number of times a year, the managing directors sit down together with the team captains and the alignment members to clarify the direction of the business unit. In order to subsequently achieve success with servitization, the team captains need to have periodic discussions with each other in which everything is coordinated and information is shared. Subsequently, it is the responsibility of the team captains to get the information to the right person within the teams. Every four weeks different business units have a large meeting in which everyone can discuss a specific theme or subject. The main goal of these sessions is to inform others and create synergy among the teams within the business unit. The subject of interest may concern the product for which the person is responsible or a market phenomenon that occurs.

Within the business units that are fully servitized, sessions are held in which the business partners and end-users are involved. During these sessions, the responsible teams receive feedback, but feedback is also given back to the users related to the overall user experience. The teams themselves determine the frequency of the mutual feedback sessions. As mentioned earlier, the teams each have their own pace which needs to be coordinated with each other when there are mutual interdependencies. This happens on a frequent basis where coordination of capacities is central. In addition, impact sessions are held with each team at these business units. During these impact sessions, it is determined what impact the team wants to make, how the team plans to achieve that impact and the progress is discussed. In addition, what the respondents have noticed is that customers want and need to be guided during the implementation process. With an 'as a serivice'-model it is of importance that customers are guided towards the highest possible revenue when a deal is made. To be more specific, ultimately the customers have to be guided towards the highest possible revenue per user.

In addition to the many communicative forms, various software applications are used to maximize communication and results and minimize recurring discussions. Think of Salesforce, Workplace, Basecamp, Slack, Confluence, and WhatsApp. It is important that teams do not communicate through too many systems. When this is the case, it can have a negative effect on the operating result because the overview has been lost and confusion has arisen. Moreover, decision-making processes might be delayed. A system that is used to achieve maximum turnover per user is the CRM system, Dynamics 365. This system takes care of recent and customer-specific data, which is used for the identification of prospects. Based on this data, choices can always be substantiated and scoring ratios can be calculated. This system is linked to the current subscriptions and contains the obtained customer feedback. According to the respondents, the system provides clarity and generates very valuable insights. These insights are used for forecasting. Good data-driven preparation ensures a certain trust towards the customer. Nevertheless, the business units of Company-X have a lot of fragmented data at their disposal. Respondents agree that even more feedback can be obtained from the current data. In addition to customer feedback, it is also important to have internal feedback on the way of organizing and managing. This is done by means of employee satisfaction surveys. These surveys contribute to the creation of a workplace where people want to work and are respected.

4.4.4 Culture

Culture is described as the underlying set of key values, beliefs, norms and understandings shared by the employees of an organization, plant or division (Daft et al., 2014; Robbins & Coulter, 2015). Results have shown that the culture within a business unit is ultimately a combination of the people, the products and the market in which the organization operates. Culture is still something intangible. However, during analysis responsibility, commitment, autonomy, and people are concepts/ conceptualizations that have been related to the overall Company-X culture. Moreover, the managing directors are aware of the fact that employees both add value to the general culture and at the same time derive characteristics from it. The following statements emphasize the above, namely; *"synergy, taking your own responsibility but also taking the initiative to do so, that is very strong in this club" (Respondent-Y, Interview Business unit-Y).* Moreover, Respondent-C describes the culture as *"it is an open culture in which it is easy to take a step. To stand up and do something, speak out and take the lead. In short, I would say it is a very informal culture in which there is a lot of steering and taking responsibility"(Interview Business unit-C)*. Respondents state that people fit into this culture or not because not everyone feels comfortable in this environment and can cope with the additional responsibilities.

Every respondent is aware that the culture differs per business unit because the culture is related to the sector in which the business unit is active and the people who work within the different business units. Analysis has shown that from the point of view of the legacy of Company-X there is still an OEM mentality. According to the respondents, the OEM mentality translates into a problem-solving culture that reacts reactively to customer problems. Success, however, requires a proactive culture in which it is possible to determine more quickly what investments need to be made so that the company can take the lead. Needless to say, customers were closely involved and choices were substantiated with the help of data. Nevertheless, there was awareness that proactive culture requires a certain mindset. However, the question remains whether the current employees have the right mindset. Respondent-Y states that; *"maybe we just need other people to do that, and with that, the culture changes by itself" (Interview Business unit-Y).*

4.4.5 People separation

In addition, results showed that in order to achieve success with a new service-based proposition, respondents prefer organizational separation rather than integration. The most important reasons for separation relate to culture formation, the necessary commitment, flexibility, mindset creation, and strategy and vision. According to the respondents, the disadvantages of integration are mainly related to the involvement and focus of the employees. Furthermore, the respondents believe that it is a major change for the employees to reason and assess from a service perspective. One of the reasons for separation, according to Respondent-R, is that one can start without any kind of legacy. This is in line with Respondent-I's statement that; *"to make a success of something, specific attention and focus must be given to it. Focus, not distraction, close to the customer, close to the market, while maintaining identity. I think that's important." (Interview Business unit-I).* Getting the people on board with a new strategy and vision takes a lot of effort and time. This is often underestimated and requires a specific focus and style of leadership. Experience has shown that it is very difficult for employees to start offering a 'disruptive' service. A major advantage of organizational separation is that an empty framework can be started. For these reasons, Respondent-R states that it is easier to separate because the organization can then hire new employees who, unlike the old employees, reason directly from a service perspective and work to make it successful. Other advantages of separation are that the proactive culture can be shaped from the start by management without distractions. The proactive culture starts with hiring the right people who believe in the strategy and vision of the organization. Respondent-R states that; *"you are leaving the problems of the past behind you. You have got a fresh start." (Interview Business unit-R).*

However, analysis has shown that within the organizational structure, responsibilities, specialization and communication are related to market translation, core values and the prevailing culture. The factor that binds this connection are the people. Results have shown that the people ensure that an appropriate structure and culture is formed with which successes can be achieved. This is also evident from the statement of Respondent-H which states that; "*if you cannot get a club of quality people to commit to you, I would not start soon. Very good people is key! Convince people why you want to do things in order to reduce resistance. To make a change in the organizational structure successful it is important to have the people with you. If you do not get the people with you, it just will not work*" *(Interview Business unit-H)*. In line with the previous statement, Respondent-I states that; "*it all starts with the right people, or with the good people. I think it is also important to put people in the right mix next to each other. Not necessarily the best in every discipline, but people who work together in the right way." (Interview Business unit-I)*. What is striking is that the emphasis in both statements is on the right people and the way in which these people are positioned in the organization. The people play the most important role in the organization and the way in which the business unit is organized. This is also evident from the statements of Respondent-Y in which the emphasis is mainly placed on strategic choices and the available competencies of the employees. Respondent-Y claims that; *"I am not so afraid of the organizational structure because we are going to adjust* *it. The pitfalls are more in the area of product strategy, that we are currently making choices, or not making choices, which you will come across later." (Interview Business unit-Y).* In addition, Respondent-Y mentions that; *"we do not worry about the organization that much, because the organization is quite flexible. It is the question 'do I have the right people on board?'. Not structure but competencies, that is also a challenge. Do I have the right competencies on board?" (Interview Business unit-Y)*. These findings show that the respondent does not see the organizational structure as a critical success factor. The emphasis on achieving success is mainly placed on the people. *'Do I have the right people?'*. An inventory of the most important factors to achieve success showed that commitment was most often mentioned by the respondents. Table 9 (Factors) shows which factors, according to the respondents, are the most important in achieving success regarding the organizational structure. Respondents were asked to name five important factors related to success. The respondents explicitly stated that there is no ranking. However, during the interviews, it was often mentioned that people are the most important factor in achieving success.

Factor	Count
Commitment	5
Direction and Vision/ Leadership	4
Communication	4
Culture	3
People	3
Responsibilities	2
Strategy-market Needs	2
Flexibility	2
(De)Centralization	1
Synergy	1
Specialization	1

Table 9 Factors

4.4.6 Core values and Theories

In addition to the structural organizational structure dimensions and the success factors, the analysis showed that there are several theories underlying the current cultures, core values and ideologies within Company-X. As mentioned earlier, the culture, the product-service offering and structure are related to the translation of market needs. The respondents, therefore, argue that the culture adapts to the market. However, analysis has shown that in order to create an internal match, the business units operate on the basis of certain core values derived from the general Company-X culture. For example, Business unit-C shaped the core values using 'the golden circle' as opposed to business unit-H which applies the Self Determination Theory. However, it is essential that the core values are taken into account in every activity of the business units.

Within Company-X, several well-known theories and books underlie the ideas, culture and current core values of the business units. These theories include exploration vs. exploitation, Lead and Disrupt, the Innovators Dilemma, and Crossing the Chasm of which the Bowling pin principle is applied in order to achieve success. In brief, the bowling pin principle means that the company starts with a minimum viable product in a specific niche market. It is important to start with a market segment that does not require too complex offerings. However, the minimum viable product must be able to meet the needs of the segment. If the company is successful in the niche market, it must find opportunities to move from that niche to other niches. At the same time, the offerings must be expanded on the basis of needs and a vision for the future. This process is repeated a number of times until the desired market is served and the company has conquered the desired market position *(Interview Business unit-R; Interview Business unit-S)*.

5.0 Conclusion and recommendations

This research presents insights into a viable organizational structure in order to offer a product-service system, emphasizing the design of the structural organizational dimensions (de)centralization, departmentalization, formalization, hierarchy, responsibilities and specialization. At first, an in-depth literature review on the topics of servitization, organizational structures and organizational dimensions was conducted. Secondly, a multiple case study at a servitizing technology organization has been conducted to answer the following research question;

"What is a viable organizational structure to offer a product-service system?"

During this research the following definition of organizational structure from Daft et al. (2014) was used, namely; *"an organizational structure designates formal reporting relationships, including the number of levels in the hierarchy and the span of control of managers and supervisors. It identifies the grouping together of individuals into departments and of departments into the total organization, and it includes the design of systems to ensure effective communication, coordination and integration of efforts across departments." (p. 97)*. Due to the fact that insights have been gathered per structural dimension, a sub-conclusion has been formulated for each dimension. Eventually, these sub-conclusions are combined to obtain an answer to the research question.

5.1 Sub-conclusions dimensions

5.1.1 (De)Centralization

Based on the results, it is concluded that in order to be successful, employees are required to have the authority to make decisions about the day-to-day business. The decision-making power must therefore be transferred to the lower levels of the organization by means of vertical decentralization. However, there are two conditions associated with the application of vertical decentralization. Firstly, it is recommended that a high degree of freedom to do business should be provided. Secondly, in the present context, decentralization requires a high degree of trust in the capabilities of the employees. Furthermore, decentralization is linked to the cultural aspect that as many employees as possible have to be in contact with customers in the specific markets. In this context, when the employees are closer to the market and the customers, employees will be in a better position to translate the needs into the product-service offering. Ultimately, vertical decentralization is intended to prevent decisions from not being taken. However, if employees cannot or do not want to take specific decisions because the decisions are associated with high risk or long-term effect, management is required to be consulted. Nonetheless, what does need to be determined centrally are the positioning of the organization in the market and the associated objectives.

5.1.2 Departmentalization

In order to achieve success, it is concluded that the organizational structure should be divided into small teams, each with a specific task or product-related responsibility. A requirement related to the responsibilities is that employees have to acquire knowledge of the market. Results have shown that departmentalization is related to growth based on market needs. Therefore, teams require division based on functional departmentalization. Moreover, by doing so, a clear picture is generated of the tasks and responsibilities of a specific team.

A common further subdivision is required to take place within the R&D, Sales, Marketing and Operations related teams. However, this subdivision depends on the size of the business unit and the number of propositions. Nevertheless, on the basis of the results, it is concluded that the further subdivision is required to be based on the required knowledge and market complexity related to the product-service offering in question. Furthermore, when the business unit has international offices, departmentalization based on geography is required to be applied in order to meet local needs and legislation. An important aspect is that the external teams continue to act on the basis of the business unit's core values, vision and quality standards. In addition, an advantage of departmentalization based on responsibilities is that each team has its own capacity and pace, which means that the development force that is created is very high because dependencies are partly eliminated. Ultimately, departmentalization is required to support the translation of market needs in order to create suitable product-service offerings that fit the market and excel in ease of use.

5.1.3 Formalization

In conclusion, in order to be successful, the formalization of processes must be arranged in such a way that progress is maintained at all times. In order to achieve this result, the right amount of formalization needs to be determined by function. The results have shown that progress is often slowed down by recurring discussions and earlier decisions. For these reasons, a balance needs to be established between sufficient and excessive formalization. The balance, however, depends on the variables employees and related responsibilities. As a result of these variables, it is not possible to determine a generally applicable formalization balance. Analysis has shown that too much formalization can lead to a loss of flexibility and a rigid structure. For these reasons, it has been concluded that formalization should be a means to cooperate in a good way in the interest of customers. Adequate formalization helps to speed up the process of connecting new employees, as procedures and manuals shape expectations. Furthermore, it is concluded that formalization is required to create frameworks regarding standards of quality. An essential condition regarding formalization is that information must be clear and transparent for everyone. Finally, it is concluded that when organizations grow, more formalization is required, because analysis has shown that growth decreases the automatic sharing of knowledge. For this reason, it is essential to set up processes that meet the need to share knowledge. Ultimately, formalization is intended to clarify the expectations of employees and to create frameworks regarding quality assurance without restricting their freedom.

5.1.4 Hierarchy

Analysis has shown that hierarchy is related to the way of organizing centralization, departmentalization, culture and people. However, it is concluded that in order to be successful, decision-making power is required to be vertically decentralized. In addition, it has been concluded that each team is charged with specific responsibilities in which freedom to do business contributes to achieving success. The team' responsibilities are not limited to just product or function related aspects. For instance, the teams are also responsible for creating a reporting structure that fits their needs. According to the results, hierarchy will ensure that this freedom will be restricted. However, the results show that the degree of hierarchy is related to the effectiveness of informing and instructing groups of employees. For this reason, it has been concluded that when a business unit has multiple foreign branches, hierarchy combined with standardization is useful to clarify responsibilities and information sharing. As a result, employees will be able to determine more quickly what is going on within the business and who is responsible for what. In addition, the organizational structure will have to be as non-hierarchical as possible in order to be successful with servitization. However, when this is not the case, employees can win discussions based on their position in the organization instead of based on substantive arguments, which ultimately restricts the employees' freedom of doing business.

5.1.5 Responsibilities

The analysis showed that in order to be successful in offering a product-service system, responsibilities play an important role. The combination of decentralization and team structure has led to the conclusion that a high degree of autonomy for the teams and employees has to be achieved in order to realize success. However, in order to provide clarity, each team is required to have a team captain (captains principle) who bears the final responsibility. Besides, the team captain has the responsibility to ensure that each team member knows his or her responsibilities and possesses the necessary knowledge and capabilities to fulfill the responsibilities. Nevertheless, when it is found that a certain specialism is required, the team members and team captains have to ensure that this required capacity is filled in or supplemented. Moreover, it is concluded that in order to achieve success, team members have to show initiative with regard to responsibilities, because of the high degree of freedom, autonomy and vertical decentralization. In addition to the captain's principle, alignment members need to be appointed within the business units who will be responsible for translating the strategy and vision to the teams. In parallel, the alignment members are required to play a role in facilitating cross-functional communication and establishing globally applicable quality-assuring frameworks and standards, thereby increasing mutual synergy.

5.1.6 Specialization

The results have shown that in order to be successful during the provision of services, the organizational structure must be specialized to a certain level. However, after analysis, it became clear that no specific level can be designated because specialization is related to the variables market needs, market complexity, team responsibilities, operational scale and size. As a consequence, business units have to determine an adequate level of specialization for themselves. However, due to the fact that tasks have to be assigned on a team level, it is up to the team captains to further subdivide tasks among the employees. The product-service offerings that an organization brings to the market are a translation of complex market needs, whereby higher market demands lead to complexity and specialism. In addition, it is concluded that specialization is related to the growth and scale on which a business unit operates. The larger the business unit the more specialized the work per function will be. Relatively more specialists will be hired when the tasks and products increasingly require more specialist knowledge. Moreover, the growth of a business will lead to more specialized questions that are market and internally driven. Finally, the high degree of autonomy in operational tasks continues to play an important role in the extent to which tasks are divided into separate functions because it is ultimately the employees themselves who decide whether or not to specialize.

5.2 General success factors

In addition to the structural organizational dimensions, certain success factors have emerged that influence the success of servitization. Sharing stories, creating a strategy, mission and vision together with as many people as possible, and the corresponding communication are important factors to achieve success.

First of all, jointly establishing a strategy, mission and vision with as many people as possible ensures that commitment and synergy are created among management and employees right from the start. While communicating the strategy, mission and vision, it is important that employees understand why certain choices have or have not been made. Moreover, it is of importance that everyone is on the same page because people naturally have a resistance to change. The key is that employees, as well as the customers, have to feel that the organization is heading towards the right direction. Communicating stories helps with the abovementioned goals. As a result, sharing stories has to ensure synergy between teams, commitment, and good communication flow. In order to promote story sharing, organizations should organize periodic recurring sessions in which as many team members as possible share stories related to their daily activities. Topics can be related to a new product feature, an activity taking place in the market or a potential customer. Involved parties such as business partners or end customers can also participate in these sessions to generate and provide feedback.

As a result of the importance of communication, the infrastructure must be arranged in such a way that mutual communication is as effective and efficient as possible. In short, the internal infrastructure is required to be aimed at communicating and aligning the strategy, vision and various stories, whereby a distinction has to be made between instruments aimed at aligning internal business operations and instruments aimed at aligning the organization on the basis of the external environment. A good example of these instruments are Slack and the CRM system. The CRM system is required to ensure that data-driven feedback is used as input for, among other things, establishing forecasts. In addition, it is important that teams do not communicate through too many systems. When this is the case, it can have a negative effect on the operating result because the overview decreases while confusion increases.

Moreover, when the organization operates in a volatile market, it is important that there is sufficient flexibility within the organizational structure. After all, organizations need to be able to respond quickly to the opportunities that arise in the market. However, flexibility is related to the responsibilities, freedom of business and the available competencies of the employees. In addition to flexibility, a proactive culture is required in which the investments to be made can be determined more quickly so that the company can take the lead. Nonetheless, in a servitization context, a proactive culture requires a specific service-oriented mindset. Organizations have to ask themselves whether the current employees have the appropriate service-oriented competences. Besides a service-oriented mindset responsibility, commitment, and autonomy are concepts that should be related to the desired culture. In addition, core values derived from literature, such as the Self Determination Theory, can serve as a guide to assess ideas and choices. Furthermore, these core values can be used in shaping the desired proactive culture.

Finally, it has been concluded that when a servitizing organization is given the opportunity to separate from a current business unit, separation has to take place. By means of separation, existing dominant routines and path dependencies are avoided, enabling managers to immediately start shaping the desired culture, commitment, mindset, flexibility, and strategy and vision. Another advantage of separation is that business can be started without any form of legacy so that product-service offerings can be created with a specific focus and attention. Moreover, the analysis showed that people are the connecting factor between responsibilities, specialization, communication, market translation, core values and the prevailing culture. As a result, it is concluded that the employees will partly determine the achievement of success.

5.3 Viable organizational structure

According to the results of the multiple case study and the literature study, it can be suggested that the most viable organizational structure in order to offer a product-service system is a low hierarchical, decentralized flat structure, whereby the employees should be the most important asset. Subsequently, the structure should be departmentalized on the basis of function, resulting in different teams, each responsible for a specific task, part, or the product-service offering as a whole. Within these teams, there should be a high degree of autonomy and freedom of doing business, wherein formalization should be used in order to create transparency, clarity, and frameworks of quality. The infrastructure of the organizational structure has to be focused on gathering and sharing information, with an emphasis on translating market needs, market complexity and feedback into the product-service offering. Moreover, it is concluded that the translation of feedback and market needs ultimately translates into the required specialism. As a consequence, the larger and more complex the product offering, the greater the demand for specialist knowledge, resulting in specialized tasks.

6.0 Discussion

6.1 Discussion

To our knowledge, this is the first research that has explored a viable design of organizational structures in a servitization context, emphasizing the structural organizational dimensions (de)centralization, departmentalization, formalization, hierarchy, responsibilities and specialization. The exploratory nature of this research has led to the identification of a number of additional findings. Within this chapter, the contribution of the multiple case study findings is discussed on the basis of existing literature. Subsequently, a reflection follows on the methodological approach used.

During this research we looked at a viable organizational structure design, emphasizing the structural dimensions (de)centralization, departmentalization, formalization, hierarchy, responsibilities and specialization. In addition, the contextual dimensions culture, commitment, (cross-functional) communication, flexibility, infrastructure and synergies were used because these relate to the servitization performance and helped to generate deeper insight into the different organizational structure designs. The main academic contribution of this research is an organizational structure design focused on the structural dimensions that can be used as a guide by servitizing organizations in order to achieve success. In the realization of the organizational structure design, the perspectives of different research domains concerning servitization and organizational structures have been taken into account. The design includes the most important structural dimensions and servitization performance-related contextual factors that a company needs to take into account during servitization. Thus, the research provides an overview of the relationship between the design of the structural organizational dimensions and servitization performance, building on the earlier studies by Fliess & Lexutt (2019), Gebauer et al. (2010), Raddats & Burton (2011) and Bustinza et al. (2015). In general, these studies lack deeper insights into how organizational structures should be structured in relation to a positive servitization performance based on practical examples. The applicability of this organizational design has not yet been tested in practice. For these reasons, the results form the basis for further future research related to the applicability.

Prior to investigating the relationship between the structural organizational dimensions and servitization performance, a tool comparison was carried out to find suitable tools to measure the servitization degree. In this comparison, five tools were compared that, according to the literature, were suitable to determine the servitization degree. The comparison showed that two tools, the servitization capacity tool (Coreynen et al., 2018) and the Relationship assessment tool (Lindgreen et al., 2006), could complement each other in order to obtain a better overview of the servitization degree. As far as we know, this is the first study in which this combination of tools was used to generate insight into the servitization degree of an organization or business unit. For these reasons, this tool comparison and the combination of tools forms a basis for further research in the future to determine the servitization degree.

Nonetheless, a number of organizational design outcomes have been identified that are consistent with past research. In short, these consistencies include the vertical decentralization of decision power, commitment, culture, separation and market translation needs. With respect to decentralization, in order to be successful, employees need to be empowered to make decisions about day-to-day operations. Therefore, decision-making power has to be vertically decentralized. The vision of decentralization confirms and reinforces Neu & Brown's statement (2005, 2008) that the success of servitization requires vertical decentralization because the lower levels are closer to the company's customers and are better able to understand how to tailor the strategy to the customer's service needs and desires. Furthermore, because the rationale behind vertical decentralization is in line with Kohtamäki & Helo's (2015) statement that value creation takes place in supplier-customer interactions, it is concluded that this statement is reinforced by the results of this research.

Furthermore, the research supports the statements of Neu & Brown (2005) and Gebauer et al. (2010) that in order for the service business to grow successfully, employees need to behave like, performance promoters, reliable problem solvers and advisors. During the research, it was established that a high degree of autonomy should be given to the employees, which is related to the growth of the organization. Employees should decide for themselves what is best for a customer and how this should be achieved, regardless of the number of customers. However, this may result in the delivered quality becoming dependent on a number of people within the organizations. For these reasons, the right balance needs to be found between formalization and standardization so that employees can perform their work as well as possible without fluctuations in the delivered quality. When this is not the case, decision making may be delayed or of insufficient quality and it may happen that the organization does not react in an innovative way to changes in the environment. These are both examples of the symptomatic structural shortcomings of Daft et al. (2014). In addition, the results suggest that the translation of needs and wants from the market has an impact on the design regarding specialization and infrastructure. When there is a specific need from the market, this will lead to a specialist knowledge need internally. As a result, the internal infrastructure should be designed to maximize knowledge sharing. Ultimately, the knowledge input should translate into output. This has shown that specialist needs translate to a higher degree of specialization. In order to translate the final needs and wants, the employees need to be close to the market. It is important for the organization to have committed and motivated employees. Not only the employees should have the feeling that the chosen strategy is the right one, but also the customers. This is in line with the belief of Neu & Brown (2005) who state that; *"the alignment of strategy and organizational factors with market conditions presents both the major challenge and the primary implication for managers"*. (p. 14).

Furthermore, research has shown that the joint setting of market-driven goals contributes to the overall commitment and synergy within the business units, in which management also plays an important role. The defined goal ultimately contributes to the overall commitment and synergy between different teams, which is in line with the statement of Gebauer, Friendli and Fleisch (2006) who state that; *“every employee in the service organization contributes to a subgoal and thus towards achieving the corporate goal. It is decisive for service organizations in manufacturing companies to define goals which function consistently together to form an overall goal and also serve to motivate employees.”* (p. 382). Moreover, if the 'top' does not see that a certain change is needed, the employees will not see it either. For these reasons, it is important to explain why choices are made and to have the right people in the right position to make a change succeed. This is in line with the statements of Antioco et al. (2008) and Oliva, Gebauer & Brann (2012) in which it is stated that the commitment and vision of the management is translated into incentives for employees related to total turnover and the success of organizational changes. In particular, the following statement by Antioco et al. (2008), “*communication across functions enhances the collective learning and efforts needed to reach common goals. Inviting employees to actively participate in reorganizations, and establishing trust between employees and company leadership facilitates organizational change.*” (p. 343), is reinforced by the findings.

Moreover, the results showed that organizations should use hierarchy, formalization and standardization to create frameworks regarding quality. The amount and degree of formalization and hierarchy is related to the growth of the organization. When there is an increase in growth, hierarchy and formalization can ensure that employees find their place in the organization faster. However, a balance needs to be found whereby the autonomy of the employees is not compromised. At the same time, the underlying reasoning regarding the ideology of vertical decentralization, responsibilities and employee authority reinforces the statement of Gebauer et al. (2009) who state that customers like to interact with empowered and well-motivated employees, which eventually leads to an increase in the satisfaction and loyalty of the customer during the service encounter.

In general, the results are related to elements that, according to Gebauer et al. (2009), contribute to service orientation, such as corporate culture, human resource management, total offering, and business strategy. However, the results showed that the organizational structure is only a smaller part of the set of various factors that influence the servitization performance of an organization. Interestingly, the results showed that people play a greater role in servitization performance and organizational design. Results have shown that people ultimately contribute to the creation of a proactive service-oriented culture. Important is that people possess a service-oriented mindset and have service-related capabilities. This statement corresponds to the statement of Gebauer et al. (2010) who state that; "*changing corporate culture towards service orientation requires employees who understand the value of services" (p. 240).* Furthermore, it is noted that the organizational structure may have a less prominent role regarding servitization performance than previously thought, where combining and obtaining the right capabilities and employees will be a greater challenge. Without the right people, respondents would not start servitization. Results have shown that the organizational structure will be adapted to the needs of the employees and the market. Therefore, employees can be seen as the connecting factor between the structural dimensions and contextual factors, in which commitment, culture and communication are important for a positive performance. Moreover, it is possible that culture, terms of employment, commitment, strategy and vision will play an important role in attracting the right people.

Additionally, the results reinforce the discussion about the integration or separation of a business unit during servitization (Fliess & Lexutt, 2019). Results have shown that when an organization is given the opportunity to create a separate business unit, this should be done so that it is possible to start without any form of legacy. The most important reasons for separation include creating the right mindset and culture. It is also suggested that through separation, managers can work with a more specific focus to shape the necessities and can fully commit themselves to create success. This corresponds to the separation points provided by Flies & Lexutt (2019) and Oliva, Gebauer & Brann (2012). Furthermore, the above is consistent with Auguste et al. (2006) who state that a separate service organization is required when managers behave in a service-oriented way and pursuit service revenue and profit since managers must fully control the targeting, pricing, delivery and development of the offering. On contrary, managers who have an integrated service organization have difficulties understanding the unique requirements and the amount of focus that is needed (Auguste et al., 2006).

6.2 Methodology discussion

In this research, an exploratory hybrid research approach was used, in which the theoretical basis was conceptualized by means of a theoretical framework. Through quantitative and qualitative research methods, this theoretical framework was tested in practice by means of multiple case studies at an internationally operating technology-driven software company. The quantitative research method consisted of a combination of the Servitization Capacitity tool of Coreynen, Matthyssens and Gebauer (2018) and the Relationship management assessment tool of Lindgreen, Palmer, Vanhamme and Wouters (2006). In addition, a semi-structured interview was used, from which the questions and topics discussed were derived from the servitization and organizational structure literature.

The servitization capacity tool has been used as a tool to measure and assess servitization readiness, identifying strengths and weaknesses, with respect to organizational factors, regarding readiness for servitization at the business units. The tool focuses on capabilities for service development, service deployment and the service orientation of corporate culture. Secondly, the tool results can be used by the business units as a means to gain experience with other business units. However, a high score on all constructs does not guarantee success. In addition, several important factors are not included in the tool such as methods for recruitment, training and assessment of personnel (Kohtamaki, Hakala, Partanen, Parida, & Wincent, 2015), skills related to value selling (Kindström, Kowalkowski, & Alejandro, 2015) and the proximity of the service organization to the customer (Gebauer, Edvardsson, Gustafsson, et al., 2010). Besides, the tool does not include any financial or other performance figures. At last, the results depend on the honesty of the respondents and the accuracy of the business unit's perception (Coreynen et al., 2018). The Relationship management assessment tool has been used as an instrument to assess elements related to relationship management on a scale from 0 to 10, whereby the answers follow each other in terms of gradation. However, in this research, a separation has been made between elements that were included and those that were not. The separation is based on the servitization literature, structural dimensions and contextual factors. If an element is not related to one of the three, it is not included. Similar to the servitization capacity tool, the relationship management tool also offers possibilities to provide insight into knowledge and skills between the business units and link them to performance. A drawback of this tool is that the elements have been identified via interviews with a case study organization, resulting in some overlap between different elements.

As Fliess & Lexutt (2019) state, the right organizational structure depends on the degree of maturity of the servitization process, where it remains unknown how the maturity of the servitization process can be determined. With hindsight, finding suitable tools and developing a combination of tools was problematic due to the fact that there are many options, and at that time it was not yet entirely clear which contextual factors would be taken into account during this research. In addition, the requirements in terms of applicability, measurability and insight made the search process even more difficult. However, with this combination of tools, an attempt was made to discover, determine and measure the maturity of the servitization process. We also tried to make as many dimensions and contextual factors as possible quantitatively measurable and insightful so that these could be related to the organizational design, with the greatest emphasis on providing insight into the performance of the business unit. This combination of applying the tools, in combination with the semi-structured interview, helps future researchers to generate, among other things, in-depth insights into the performance of a department, business unit or company with regard to its organizational structure. This research can also be seen as a test of both the servitization capacity tool and the relationship management assessment tool. The semi-structured questionnaire can also be seen as a tool for future researchers to find information behind organizational structural choices. However, not all structural organizational dimensions and contextual factors have been included in this research.

6.3 Practical contribution

From a practical business perspective, this research makes important contributions regarding the future of the researched department. At first, this research provides the management with guidance for the future towards a viable organizational structure to deliver product-service offerings as a service. The recommendations are based on literature and relevant practical insights that have been gathered throughout the company's different business units. However, other variables may influence the future who have not been discussed during this research. Thus, the recommendations are focused on the learnings regarding the organizational design for the future. Second, from a more overall tactical perspective, this research provides Company-X with guidelines that can be relevant for every business unit. The insights that are generated are valuable because the learnings are applicable for every managing director that wants to deliver products as a service and struggles to find the most viable organizational structure. In summary, the managing directors can learn from each other's insights and opinions on the related topics. Third, the outcomes of the tools that the managing directors have filled in pinpoint the strengths and weaknesses regarding the topics that have been dealt with. The scores can be linked with desired organizational outcomes and can be used as a starting point for improvement of the business unit or specific topics. In summary, the learnings and recommendations that have been generated and captured regarding the organizational structure can serve the whole company, especially BEAT.

7.0 Limitations.

This research is based on both literature and empirical findings. First of all, an extensive amount of various literature streams have been brought together after which a theoretical framework has been established. Subsequently, it was decided to test this theoretical framework by combining quantitative tools with a semi-structured interview. However, not all structural organizational dimensions from the literature are included in this methodology, nor are the contextual factors and dimensions size, goal and strategy, and personnel ratios. As a result, this is considered as one of the limitations of the research. As mentioned in the discussion, the tools also have their limitations. The servitization readiness tool does not include any financial or performance components in the assessment as well as factors relating to the hiring, training and assessment of personnel. The main limitation of the relationship management assessment tool is that the elements are the result of an analysis of interviews from case studies, resulting in some overlap between different elements. In addition to the limitations of the tools, a possible data bias has arisen because the tools are based on the honesty of the respondents. Respondents must have filled in the tools truthfully, but this cannot be ascertained.

Moreover, a limitation of this research is found in the single-organization approach. Although the information was obtained from business units other than the focal research group with which interviews were conducted, it still reflects the same overarching organizational culture. In addition, within this research, only one interview per business unit was conducted, resulting in a total of seven interviews. However, only one interview per business unit remained due to, among other things, time pressure and the fact that the respondents ultimately have the authority to make such decisions about the organizational structure. Within this research, the number of interviews, and thus the validity of the data, could be increased by approaching external parties. However, this was not possible due to the confidentiality of the information. Afterwards, it was concluded that the quality and depth of the interview varied per respondent. In addition to the fact that the quality and depth varied, the timing of the interview also played an important role in the data obtained. For example, one of the business units is in the middle of a transition. The respondent himself indicated that if we did the same interview again in one year, the answers could vary considerably. Furthermore, the role of the respondents also plays a limiting role in this research, as a result of which the reliability of the interview needs to be questioned. However, this is because potentially entangled interests, which belong to the role of the respondents, played a role in answering both the tools and the interview questions. Given that intertwined underlying interests could play a role, it would be possible that certain behaviour and certain signals could be avoided. Together, these limitations limit the reliability and generalizability of the results.

8.0 Future Research

As a result of the conclusion, discussion and limitations, it has been concluded that various possibilities for future research have been created while conducting this research. At first, future studies might build on the current research by increasing the number of case studies. Secondly, the scope of the research can be extended by conducting the research in different regions and sectors in order to increase the generalizability of the results, whereby it is important that the defined organizational structure is tested. Moreover, it would be interesting to carry out long-term research in which different companies, which are servitizing, are being monitored regarding the organizational structure and the corresponding choices, in order to develop more detailed insights into the choices and design of the organizational structure in certain phases of the servitization process. It can be an addition to the current literature, because research regarding organizational structure in a servitization context often proceeds on the basis of a start and endpoint, but does not consider the phases in-between.

Thirdly, the hybrid methodology developed, based on a combination of the servitization readiness tool of Coreynen, Matthyssens, and Gebauer (2018) and the Relationship-management assessment tool of Lindgreen, Palmer, Vanhamme, and Wouters (2006) and semi-structured interviews, can be expanded with contextual factors and organizational dimensions to investigate the generalizability of the current outcome and to test both the reliability and the generalizability of the method. Furthermore, the appropriateness of the method to determine the maturity of the servitization process needs to be investigated.

Finally, it may be interesting to dedicate future research to the relationship between the organizational structure, the required servitization related capabilities and HRM-related processes and facets, in which the organizational culture plays an important role, perhaps a moderating effect. This needs to be investigated because during the research it emerged that, according to the respondents, the organizational structure is not seen as the biggest problem during the servitization transition to achieve success. According to the respondents, it is more important to look at the relationship between HRM and the required capacities. As a result of this outcome, the organizational structure should be established. Perhaps these outcomes could help future managers to acquire the right capabilities and human capital in addition to a suitable organizational structure.

References

Ahamed, Z., Inohara, T., & Kamoshida, A. (2013). The Servitization of Manufacturing: An Empirical Case Study of IBM Corporation. *International Journal of Business Administration*, *4*(2), 18–26. https://doi.org/10.5430/ijba.v4n2p18

Ahamed, Z., Kamoshida, A., & Inohara, T. (2013). Organizational Factors to the Effectiveness of Implementing Servitization Strategy. *Journal of Service Science and Management*, *06*(02), 177–185. https://doi.org/10.4236/jssm.2013.62018

Ahmad, T., Morelli, U., Ranise, S., & Zannone, N. (2018). A Lazy Approach to Access Control as a Service (ACaaS) for IoT. *Proceedings of the 23nd ACM on Symposium on Access Control Models and Technologies - SACMAT '18*, 235–246. https://doi.org/10.1145/3205977.3205989

Ahmady, A. G., Mehrpour, M., & Nikooravesh, A. (2018). Organizational Structures. In *The European Research Management Handbook* (Vol. 230, pp. 89–107). https://doi.org/10.1016/B978-0-12-805059-0.00004-3

Alghisi, A., & Saccani, N. (2015). Internal and external alignment in the servitization journey – overcoming the challenges. *Production Planning & Control*, *26*(14–15), 1219–1232. https://doi.org/10.1080/09537287.2015.1033496

Alvarez, R. L. P., Martins, M. R., & Terra da Silva, M. (2015). Applying the maturity model concept to the servitization process of consumer durables companies in Brazil. *Journal of Manufacturing Technology Management*, *26*(8), 1086–1106. https://doi.org/http://dx.doi.org/10.1108/JMTM-04-2014-0050

Antioco, M., Moenaert, R. K., Lindgreen, A., & Wetzels, M. G. M. (2008). Organizational antecedents to and consequences of service business orientations in manufacturing companies. *Journal of the Academy of Marketing Science*, *36*(3), 337–358. https://doi.org/10.1007/s11747-008-0085-1

Atos Consulting. (2011). Servitization in product companies. In *World*.

Auguste, B. G., Harmon, E. P., & Pandit, V. (2006). The right service strategies for product companies. *The McKinsey Quarterly*, *1*(1), 40–51. Retrieved from https://serviceinindustry.files.wordpress.com/2015/02/the-right-service-strategy-for-product-companies.pdf

Auh, S., & Menguc, B. (2007). Performance implications of the direct and moderating effects of centralization and formalization on customer orientation. *Industrial Marketing Management*, *36*(8), 1022–1034. https://doi.org/10.1016/j.indmarman.2006.02.010

Baines, T., & Lightfoot, H. (2013). *Made to serve: How manufacturers can compete through servitization and product-service systems*. Chichester: John Wiley & Sons Inc.

Baines, T., Lightfoot, H., Smart, P., & Fletcher, S. (2013). Servitization of manufacture: Exploring the deployment and skills of people critical to the delivery of advanced services. *Journal of Manufacturing Technology Management*, *24*(4), 637–646. https://doi.org/10.1108/17410381311327431

Baines, T., & Lightfoot, H. W. (2014). Servitization of the manufacturing firm: Exploring the operations practices and technologies that deliver advanced services. *International Journal of Operations and Production Management*, *34*(1), 2–35. https://doi.org/10.1108/IJOPM-02-2012-0086

Baines, T., Lightfoot, H. W., Benedettini, O., & Kay, J. M. (2009). The servitization of manufacturing. *Journal of Manufacturing Technology Management*, *20*(5), 547–567. https://doi.org/10.1108/17410380910960984

Baines, T. S. (2013). *Servitization impact study*. Retrieved from https://connect.innovateuk.org/documents/416351/3926914/Servitization+impact+study.pdf/

Baines, T. S., Lightfoot, H. W., Evans, S., Neely, A., Greenough, R., Peppard, J., … Wilson, H. (2007). State-of-the-art in product-service systems. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, *221*(10), 1543–1552. https://doi.org/10.1243/09544054JEM858

Baines, T. S., Lightfoot, H. W., & Kay, J. M. (2009). Servitized manufacture: Practical challenges of delivering integrated products and services. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, *223*(9), 1207–1215.

https://doi.org/10.1243/09544054JEM1552
Baines, T., Ziaee Bigdeli, A., Sousa, R., & Schroeder, A. (2020). Framing the servitization transformation process: A model to understand and facilitate the servitization journey. *International Journal of Production Economics*, *221*(August 2019), 107463. https://doi.org/10.1016/j.ijpe.2019.07.036
Benedettini, O., Neely, A., & Swink, M. (2015). Why do servitized firms fail? A risk-based explanation. *Ship Technology Research*, *53*(4), 194–200. https://doi.org/10.1179/str.2006.53.4.005
Berkovich, M., Leimeister, J. M., Hoffmann, A., & Krcmar, H. (2014). A requirements data model for product service systems. *Requirements Engineering*, *19*(2), 161–186. https://doi.org/10.1007/s00766-012-0164-1
Bigdeli, A. Z., & Baines, T. (2017). Organisational Transformation Towards Servitization. *Proceedings of the Spring Servitization Conference (SSC2017)*, (June). Retrieved from https://www.researchgate.net/profile/Ali_Ziaee_Bigdeli/publication/317559945_Organisational_Transformation_towards_Servitization/links/593ff51ea6fdcc1b10c2cc0b/Organisational-Transformation-towards-Servitization.pdf
Bigdeli, A. Z., Baines, T., Bustinza, O. F., & Shi, V. G. (2017). Organisational Change towards Servitization: A Theoretical Framework. *Competitiveness Review: An International Business Journal Competitiveness Review Iss International Journal of Operations & Production Management*, *27*(2), 256–278. Retrieved from http://dx.doi.org/10.1108/CR-03-2015-0015%5Cnhttp://dx.doi.org/10.1108/IJOPM-06-2015-0312
Bigdeli, A. Z., Baines, T., Schroeder, A., Brown, S., Musson, E., Guang Shi, V., & Calabrese, A. (2018). Measuring servitization progress and outcome: the case of 'advanced services.' *Production Planning & Control*, *29*(4), 315–332. https://doi.org/10.1080/09537287.2018.1429029
Biggemann, S., Kowalkowski, C., Maley, J., & Brege, S. (2013). Development and implementation of customer solutions: A study of process dynamics and market shaping. *Industrial Marketing Management*, *42*(7), 1083–1092. https://doi.org/10.1016/j.indmarman.2013.07.026
Brax, S. (2005). A manufacturer becoming service provider - Challenges and a paradox. *Managing Service Quality*, *15*(2), 142–155. https://doi.org/10.1108/09604520510585334
Bryman, A., & Bell, E. (2015). *Business research methods* (4th ed.). Oxford: Oxford University Press.
Bustinza, O. F., Bigdeli, A. Z., Baines, T., & Elliot, C. (2015). Servitization and Competitive Advantage: The Importance of Organizational Structure and Value Chain Position. *Research-Technology Management*, *58*(5), 53–60. https://doi.org/10.5437/08956308x5805354
Cambridge University Press. (2020). Synergie. Meaning in the Cambridge English dictionary. Retrieved January 23, 2020, from https://dictionary.cambridge.org/dictionary/english/synergy
Chandler, A. D. (1962). Strategy and Structure : Chapters in the History of the Industrial Enterprise. *The American Historical Review*, *68*(1), 158–160. https://doi.org/10.2307/1847244
Coreynen, W., Matthyssens, P., & Gebauer, H. (2018). *Are you ready for servitization? A tool to measure servitization capacity* (pp. 25–40). pp. 25–40. https://doi.org/10.1007/978-3-319-76517-4_2
Crozet, M., & Milet, E. (2017). Should everybody be in services? The effect of servitization on manufacturing firm performance. *Journal of Economics and Management Strategy*, *26*(4), 820–841. https://doi.org/10.1111/jems.12211
Cunningham, J. B. (1977). Approaches to the Evaluation of Organizational Effectiveness. *Academy of Management Review*, *2*(3), 463–474. https://doi.org/10.5465/amr.1977.4281841
Daft, R. L., Murphy, J., & Willmott, H. (2014). *Organization Theory and Design: an internal perspective*. Andover: Cengage Learning EMEA.
Davies, A. (2004). Moving base into high-value integrated solutions: A value stream approach. *Industrial and Corporate Change*, *13*(5), 727–756. https://doi.org/10.1093/icc/dth029
Dimache, A., & Roche, T. (2013). A decision methodology to support servitisation of manufacturing. *International Journal of Operations & Production Management*, *33*(11/12), 1435–1457. https://doi.org/10.1108/IJOPM-07-2010-0186
Doni, F., Corvino, A., & Bianchi Martini, S. (2019). Servitization and sustainability actions. Evidence from European manufacturing companies. *Journal of Environmental Management*, *234*(August 2018), 367–378. https://doi.org/10.1016/j.jenvman.2019.01.004

Ducq, Y., Chen, D., & Alix, T. (2012). Enterprise Interoperability. In M. van Sinderen, P. Johnson, X. Xu, & G. Doumeingts (Eds.), *Lecture Notes in Business Information Processing*. https://doi.org/10.1007/978-3-642-33068-1

Eggert, A., Thiesbrummel, C., & Deutscher, C. (2014). Differential effects of product and service innovations on the financial performance of industrial firms. *J Bus Mark Manag*, *7*(3), 380–405. Retrieved from http://www.jbm-online.net/index.php/jbm/article/view/80/84

Eloranta, V. (2016). *Servitization, strategy and platforms*. Retrieved from https://aaltodoc.aalto.fi/bitstream/handle/123456789/20251/isbn9789526067728.pdf?sequence=1&isAllowed=y

Eloranta, V., & Turunen, T. (2015). Seeking competitive advantage with service infusion: A systematic literature review. In *Journal of Service Management* (Vol. 26). https://doi.org/10.1108/JOSM-12-2013-0359

Fang, E. (Er), Palmatier, R. W., & Steenkamp, J.-B. E. . (2008). Effect of Service Transition Strategies on Firm Value. *Journal of Marketing*, *72*(5), 1–14. https://doi.org/10.1509/jmkg.72.5.1

Fliess, S., & Lexutt, E. (2019). How to be successful with servitization – Guidelines for research and management. *Industrial Marketing Management*, *78*, 58–75. https://doi.org/10.1016/j.indmarman.2017.11.012

Galbraith, J. R. (2002). *Designing organizations: An executive guide to strategy, structure, and process*. San Fransisco: Jossey-Bass.

Gartner. (2014). *The Internet of Things will transform the data center*. Retrieved from https://www.gartner.com/en/newsroom/press-releases/2014-03-24-gartner-says-a-thirty-fold-increase-in-internet-connected-physical-devices-by-2020-will-significantly-alter-how-the-supply-chain-operates

Gebauer, H. (2008). Identifying service strategies in product manufacturing companies by exploring environment-strategy configurations. *Industrial Marketing Management*, *37*(3), 278–291. https://doi.org/10.1016/j.indmarman.2007.05.018

Gebauer, H., Bravo-sanchez, C., Fleisch, E., & Gebauer, H. (2008). *Service strategies in product manufacturing companies*. *9*(1), 12–20. https://doi.org/10.1108/17515630810850073

Gebauer, H., Edvardsson, B., & Bjurko, M. (2010). The impact of service orientation in corporate culture on business performance in manufacturing companies. *Journal of Service Management*, *21*(2), 237–259. https://doi.org/10.1108/09564231011039303

Gebauer, H., Edvardsson, B., Gustafsson, A., & Witell, L. (2010). Match or mismatch: Strategy-structure configurations in the service business of manufacturing companies. *Journal of Service Research*, *13*(2), 198–215. https://doi.org/10.1177/1094670509353933

Gebauer, H., Fischer, T., & Fleisch, E. (2010). Exploring the interrelationship among patterns of service strategy changes and organizational design elements. *Journal of Service Management*, *21*(1), 103–129. https://doi.org/10.1108/09564231011025137

Gebauer, H., & Fleisch, E. (2007). An investigation of the relationship between behavioral processes, motivation, investments in the service business and service revenue. *Industrial Marketing Management*, *36*(3), 337–348. https://doi.org/10.1016/j.indmarman.2005.09.005

Gebauer, H., Fleisch, E., & Friedli, T. (2005). Overcoming the service paradox in manufacturing companies. *European Management Journal*, *23*(1), 14–26. https://doi.org/10.1016/j.emj.2004.12.006

Gebauer, H., Friedli, T., & Fleisch, E. (2006). Success factors for achieving high service revenues in manufacturing companies. *Benchmarking*, *13*(3), 374–386. https://doi.org/10.1108/14635770610668848

Gebauer, H., & Kowalkowski, C. (2012). Customer-focused and service-focused orientation in organizational structures. *Journal of Business & Industrial Marketing*, *27*(7), 527–537. https://doi.org/10.1108/08858621211257293

Gebauer, H., Pütz, F., Fischer, T., & Fleisch, E. (2009). Service orientation of organizational structures. *Journal of Relationship Marketing*, *8*(2), 103–126. https://doi.org/10.1080/15332660902876687

Gebauer, H., Ren, G.-J., Valtakoski, A., & Reynoso, J. (2012). *Service-driven manufacturing Provision, evolution and financial impact of services in industrial firm*. *23*(1), 120–138.

https://doi.org/http://dx.doi.org/10.1108/09564231211209005
Gillior, H. (2018). Digitalisation - An unstoppable mega trend. Retrieved February 5, 2018, from Institute for digital transformation website: https://www.institutefordigitaltransformation.org/digitalisation-an-unstoppable-mega-trend/
Gudergan, G., Buschmeyer, A., Krechting, D., & Feige, B. (2015). Evaluating the Readiness to Transform Towards a Product-service System Provider by a Capability Maturity Modelling Approach. *Procedia CIRP*, *30*, 384–389. https://doi.org/10.1016/j.procir.2015.02.134
Hara, T., Sato, K., & Arai, T. (2016). Modeling the transition to a provider–customer relationship in servitization for expansion of customer activity cycles. *CIRP Annals - Manufacturing Technology*, *65*(1), 173–176. https://doi.org/10.1016/j.cirp.2016.04.094
Holcomb, T. R., & Hitt, M. A. (2007). Toward a model of strategic outsourcing. *Journal of Operations Management*, *25*(2), 464–481. https://doi.org/10.1016/j.jom.2006.05.003
Jacobides, M. G. (2007). The Inherent Limits of Organizational Structure and the Unfulfilled Role of Hierarchy: Lessons from a Near-War. *Organization Science*, *18*(3), 455–477. https://doi.org/10.1287/orsc.1070.0278
Kindström, D. (2010). Towards a service-based business model – Key aspects for future competitive advantage. *European Management Journal*, *28*(6), 479–490. https://doi.org/10.1016/j.emj.2010.07.002
Kindström, D., Kowalkowski, C., & Alejandro, T. B. (2015). Adding services to product-based portfolios. *Journal of Service Management*, *26*(3), 372–393. https://doi.org/10.1108/JOSM-02-2014-0042
Kinnunen, R.-E., & Turunen, T. (2012). Identifying Servitization Capabilities of Manufacturers: A Conceptual Model. *Journal of Applied Management and Entrepreneurship*, *17*(3), 55–79.
Kirchmer, M., Franz, P., Lotterer, A., Antonucci, Y., & Laengle, S. (2016). *The Value-Switch for Digitalization Initiatives: Business Process Management*. Retrieved from https://bpm-d.com/wp-content/uploads/2016/05/Digitilization_Whitepaper-Letter_v04.pdf
Kohtamäki, M., Baines, T., Rabetino, R., & Bigdeli, A. Z. (2018). *Practices and tools for Servitization*.
Kohtamaki, M., Hakala, H., Partanen, J., Parida, V., & Wincent, J. (2015). The performance impact of industrial services and service orientation on manufacturing companies. *Journal of Service Theory and Practice*, *25*(4), 463–485. https://doi.org/10.1108/JSTP-12-2013-0288
Kohtamäki, M., & Helo, P. (2015). The solution provider's stairway to heaven or highway to hell? *Benchmarking: An International Journal*, *22*(2), 170–185. https://doi.org/10.1108/BIJ-01-2015-0002
Kohtamäki, M., Partanen, J., Parida, V., & Wincent, J. (2013). Non-linear relationship between industrial service offering and sales growth: The moderating role of network capabilities. *Industrial Marketing Management*, *42*(8), 1374–1385. https://doi.org/10.1016/j.indmarman.2013.07.018
Kowalkowski, C., Gebauer, H., & Oliva, R. (2017). Service growth in product firms: Past, present, and future. *Industrial Marketing Management*, *60*, 82–88. https://doi.org/10.1016/j.indmarman.2016.10.015
Kowalkowski, C., Kindström, D., & Witell, L. (2011). Internalisation or externalisation? *Managing Service Quality: An International Journal*, *21*(4), 373–391. https://doi.org/10.1108/09604521111146252
Krackhardt, D., & Porter, L. W. (1986). The snowball effect: Turnover embedded in communication networks. *Journal of Applied Psychology*, *71*(1), 50–55. https://doi.org/10.1037/0021-9010.71.1.50
Kucza, G., & Gebauer, H. (2011). Global approaches to the service business in manufacturing companies. *Journal of Business & Industrial Marketing*, *26*(7), 472–483. https://doi.org/10.1108/08858621111162271
Lam, A. (2010). Innovative organizations: Structure, Learning and adaptation. *Innovation Perspectives for the 21st Century*, *1*(April), 163–180. Retrieved from https://www.researchgate.net/profile/Alice_Lam2/publication/265007273_Innovative_Organizations_Structure_Learning_and_Adaptation/links/54baed9e0cf24e50e9403804.pdf
Lavrakas, P. J. (2008). *Encyclopedia of Survey Research Methods*. https://doi.org/10.4135/9781412963947
Lay, G., Copani, G., Jäger, A., & Biege, S. (2010). The relevance of service in European manufacturing industries. *Journal of Service Management*, *21*(5), 715–726. https://doi.org/10.1108/09564231011092908

Lightfoot, H., Baines, T., & Smart, P. (2013). The servitization of manufacturing: A systematic literature review of interdependent trends. *International Journal of Operations and Production Management*, *33*(11), 1408–1434. https://doi.org/10.1108/IJOPM-07-2010-0196
Lindgreen, A., Palmer, R., Vanhamme, J., & Wouters, J. (2006). A relationship-management assessment tool: Questioning, identifying, and prioritizing critical aspects of customer relationships. *Industrial Marketing Management*, *35*(1), 57–71. https://doi.org/10.1016/j.indmarman.2005.08.008
Lunenburg, F. C. (2012). Organizational Structure: Mintzberg's Framework. *International Journal for Scholarly, Academic, Intellectual Diversity*, *14*(1), 1–8. Retrieved from https://platform.europeanmoocs.eu/users/8/Lunenburg-Fred-C.-Organizational-Structure-Mintzberg-Framework-IJSAID-V14-N1-2012.pdf
Martinez, V., Bastl, M., Kingston, J., & Evans, S. (2010). Challenges in transforming manufacturing organisations into product-service providers. *Journal of Manufacturing Technology Management*, *21*(4), 449–469. https://doi.org/10.1108/17410381011046571
Mathieu, V. (2001). Service strategies within the manufacturing sector: benefits, costs and partnership. *International Journal of Service Industry Management*, *12*(5), 451–475. https://doi.org/10.1108/EUM0000000006093
McIvor, R. (2009). How the transaction cost and resource-based theories of the firm inform outsourcing evaluation. *Journal of Operations Management*, *27*(1), 45–63. https://doi.org/10.1016/j.jom.2008.03.004
Meijaard, J., Brand, M. J., & Mosselman, M. (2005). Organizational Structure and Performance in Dutch small Firms. *Small Business Economics*, *25*(1), 83–96. https://doi.org/10.1007/s11187-005-4259-7
Mintzberg, H. (1979a). PDF The structuring of Organizations. In *Climate Change 2013 - The Physical Science Basis*. https://doi.org/10.1017/CBO9781107415324.004
Mintzberg, H. (1979b). *The structuring of organizations: a synthesis of the research*. Englewood Cliffs: Prentice-Hall.
Mintzberg, H. (1990). The design school: Reconsidering the basic premises of strategic management. *Strategic Management Journal*, *11*(3), 171–195. https://doi.org/10.1002/smj.4250110302
Mintzberg, H. (1992). *Structure in Fives: Designing Effective Organizations* (1st ed.). Upper Saddle River: Prentice-Hall.
Mintzberg, H. (2007). *Tracking strategies: toward a general theory* (6th ed.). New York: Oxford University Press.
Moore, G. A. (1991). *Crossing the chasm: Marketing and selling technology products to mainstream customers* (6th ed.). New York, N.Y.: HarperBusiness.
Nadler, D. A., Gerstein, M. C., & Shaw, R. B. (1992). *Organizational architecture: Designs for changing organizations.* Oakland: Jossey-Bass.
Neely, A. (2008). Exploring the financial consequences of the servitization of manufacturing. *Operations Management Research*, *1*(2), 103–118. https://doi.org/10.1007/s12063-009-0015-5
Neu, W. A., & Brown, S. W. (2005). Forming Successful Business-to-Business Services in Goods-Dominant Firms. *Journal of Service Research*, *8*(1), 3–17. https://doi.org/10.1177/1094670505276619
Neu, W. A., & Brown, S. W. (2008). Manufacturers forming successful complex business services: Designing an organization to fit the market. *International Journal of Service Industry Management*, *19*(2), 232–251.
Oliva, R., Gebauer, H., & Brann, J. M. (2012). Separate or Integrate? Assessing the Impact of Separation Between Product and Service Business on Service Performance in Product Manufacturing Firms. *Journal of Business-to-Business Marketing*, *19*(4), 309–334. https://doi.org/10.1080/1051712X.2012.647797
Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management*, *14*(2), 160–172. https://doi.org/10.1108/09564230310474138
Opresnik, D., & Taisch, M. (2015). The manufacturer's value chain as a service - the case of remanufacturing. *Journal of Remanufacturing*, *5*(1), 1–23. https://doi.org/10.1186/s13243-015-0011-x
Pugh, D. S., Hickson, D. J., Hinings, C. R., & Turner, C. (1968). Dimensions of Organizational Commitment.

Administrative Science Quarterly., *13*(1), 65–105. Retrieved from https://www.jstor.org/stable/2391262
Rabetino, R., Harmsen, W., Kohtamäki, M., & Sihvonen, J. (2018). Structuring servitization-related research. *International Journal of Operations and Production Management*, *38*(2), 350–371. https://doi.org/10.1108/IJOPM-03-2017-0175
Raddats, C., & Burton, J. (2011). Strategy and structure configurations for services within product-centric businesses. *Journal of Service Management*, *22*(4), 522–539. https://doi.org/10.1108/09564231111155105
Raddats, C., Burton, J., Zolkiewski, J., & Story, V. (2018). Overcoming the Challenges of Servitisation: Aligning Responses to Service Strategy. In *Practices and Tools for Servitization* (pp. 171–184). https://doi.org/10.1007/978-3-319-76517-4_9
Raddats, C., & Easingwood, C. (2010). Services growth options for B2B product-centric businesses. *Industrial Marketing Management*, *39*(8), 1334–1345. https://doi.org/10.1016/j.indmarman.2010.03.002
Raddats, C., Kowalkowski, C., Benedettini, O., Burton, J., & Gebauer, H. (2019). Servitization: A contemporary thematic review of four major research streams. *Industrial Marketing Management*, (October 2018), 1–17. https://doi.org/10.1016/j.indmarman.2019.03.015
Raddats, C., Story, V., Burton, J., Zolkiewski, J., & Baines, T. (2014). *Servitization Capabilities for Advanced services: A multi-actor perspective*. Retrieved from https://research.aston.ac.uk/en/publications/servitization-capabilities-for-advanced-services-a-multi-actor-pe
Rapaccini, M., Saccani, N., Pezzotta, G., Burger, T., & Ganz, W. (2013). Service development in product-service systems: a maturity model. *The Service Industries Journal*, *33*(3–4), 300–319. https://doi.org/10.1080/02642069.2013.747513
Robbins, S. P., & Coulter, M. (2015). *Management* (13th ed.). London: Pearson Education.
Salonen, A. (2011). Service transition strategies of industrial manufacturers. *Industrial Marketing Management*, *40*(5), 683–690. https://doi.org/10.1016/j.indmarman.2011.05.005
Shah, D., Rust, R. T., Parasuraman, A., Staelin, R., & Day, G. S. (2006). The path to customer centricity. *Journal of Service Research*, *9*(2), 113–124. https://doi.org/10.1177/1094670506294666
Shahriari, J. E., Maleki, J., Koolivand, P., & Meyvand, M. (2013). The study of the relationship between organizational structure and psychological empowerment among the staffs in Ministry of Economic Affairs and Finance. *European Online Journal of Natural and Social Sciences*, *2*(3(s)), 330–338.
Shimomura, Y., Nemoto, Y., & Kimita, K. (2015). A method for analysing conceptual design process of product-service systems. *CIRP Annals - Manufacturing Technology*, *64*(1), 145–148. https://doi.org/10.1016/j.cirp.2015.04.035
Somaya, D., Williamson, I. O., & Lorinkova, N. (2008). Gone but Not Lost: The Different Performance Impacts of Employee Mobility Between Cooperators Versus Competitors. *Academy of Management Journal*, *51*(5), 936–953. https://doi.org/10.5465/amj.2008.34789660
Srai, J. S., & Lorentz, H. (2018). Developing design principles for the digitalisation of purchasing and supply management. *Journal of Purchasing and Supply Management*, *25*(1), 78–98. https://doi.org/10.1016/j.pursup.2018.07.001
Stacey, R. D. (2007). *Strategic Management and Organisational Dynamics: The challenge of complexity to ways of thinking about organisations* (5th ed.). New York: Pearson Education.
Storbacka, K. (2011). A solution business model: Capabilities and management practices for integrated solutions. *Industrial Marketing Management*, *40*(5), 699–711. https://doi.org/10.1016/j.indmarman.2011.05.003
Story, V. M., Raddats, C., Burton, J., Zolkiewski, J., & Baines, T. (2017). Capabilities for advanced services: A multi-actor perspective. *Industrial Marketing Management*, *60*, 54–68. https://doi.org/10.1016/j.indmarman.2016.04.015
Tracy, S. (2013). *Qualitative research methods*. Chichester: UK: Wiley-Blackwell.
Turunen. (2013). *Organizing Service operations in manufacturing*. Retrieved from https://aaltodoc.aalto.fi/handle/123456789/7721

Turunen, T., & Finne, M. (2014). The organisational environment's impact on the servitization of manufacturers. *European Management Journal*, *32*(4), 603–615. https://doi.org/10.1016/j.emj.2013.11.002

Ulaga, W., & Reinartz, W. J. (2011). Hybrid Offerings: How Manufacturing Firms Combine Goods and Services Successfully. *Journal of Marketing*, *75*(6), 5–23. https://doi.org/10.1509/jm.09.0395

Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, *6*(4), 314–324. https://doi.org/10.1016/0263-2373(88)90033-3

Varadharajan, V., & Tupakula, U. (2014). Security as a Service Model for Cloud Environment. *IEEE Transactions on Network and Service Management*, *11*(1), 60–75. https://doi.org/10.1109/TNSM.2014.041614.120394

Visnjic, I., Wiengarten, F., & Neely, A. (2016). Only the Brave: Product Innovation, Service Business Model Innovation, and Their Impact on Performance. *Journal of Product Innovation Management*, *33*(1), 36–52. https://doi.org/10.1111/jpim.12254

Visnjic Kastalli, I., & Van Looy, B. (2013). Servitization: Disentangling the impact of service business model innovation on manufacturing firm performance. *Journal of Operations Management*, *31*(4), 169–180. https://doi.org/10.1016/j.jom.2013.02.001

Wiesner, S., Peruzzini, M., Doumeingts, G., & Thoben, K.-D. (2013). Requirements Engineering for Servitization in Manufacturing Service Ecosystems (MSEE). In *The Philosopher's Stone for Sustainability* (pp. 291–296). https://doi.org/10.1007/978-3-642-32847-3_49

Windahl, C. (2007). *Integrated solutions in the capital goods sector - Exploring innovation , service and network perspectives*. Retrieved from https://www.researchgate.net/publication/258642127%0AIntegrated

Windahl, C., & Lakemond, N. (2006). Developing integrated solutions: The importance of relationships within the network. *Industrial Marketing Management*, *35*(7), 806–818. https://doi.org/10.1016/j.indmarman.2006.05.010

Yin, R. K. (2017). *Case study research and applications: Design and Methods* (6th ed.). Thousand Oaks: Sage Publications Inc.

Appendices

Appendix I: Servitization-related research

This appendix includes a structure of the different communities, clusters and streams that are related to servitization research according to Rabetino et al. (2018). The path for this research is marked in green.

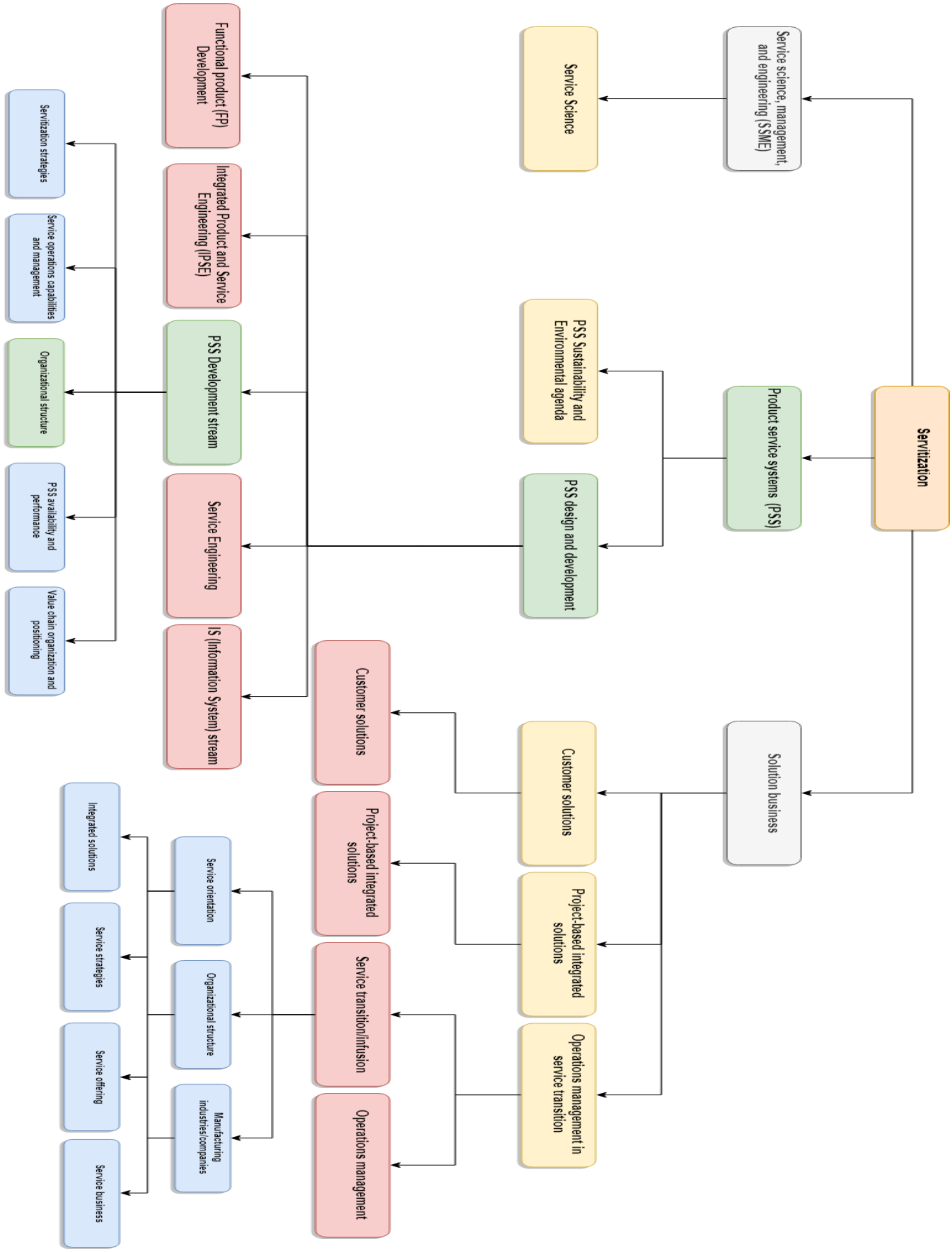

Figure 34 Servitization related research (Rabetino et al., 2018)

Appendix II : Servitization Strategies

Within this appendix deeper insights within multiple strategies are elaborated. At first the strategies of Mathieu (2001) are elaborated, followed by the product-service system forms of Neely (2008). At last, the servitization strategies of Raddats and Easingwood (2010) are briefly elaborated.

Mathieu (2001) - Internalising means that in an internal organisational arrangement, the core activities associated with service provision are performed in-house. Regardless of whether the product and service organizations are integrated or separated. Kowalkowski, Kindström and Witell (2011) define core activities as "activities that are identified by management as pivotal for the service business in the markets in which the firm operates" (p. 8). Outsourcing, or externalising means that the responsibility for all service provision is placed at the service partners. In contrary to internalising, outsourcing means that even core service activities are performed in an external organizational arrangement. Finally, in the partnering/ hybrid configuration the responsibilities concerning services are shared with different service partners. According to Kowalkowski, Kindström and Witell (2011) many companies favour the hybrid arrangements that combine service-focused organizational structures and customer-focused organizational structures. In this setting service-focused organizational structures have a distinct business unit for services that includes selling and delivery, while customer-focused organizational structure use customers to form the basis for structuring the firm (Kowalkowski et al., 2011; Mathieu, 2001)

NEELY (2008) - In short, five different forms of product-service systems are elaborated. Each of these forms can be seen as a servitization strategy that a company can adopt. The elaborated forms of PSS are focused around integration, product, service, use and result.

Integration oriented PSS. Implementing integration oriented PSS means that a company goes downstream by adding services through vertical integration. This means that the ownership of the tangible product is still transferred to the customer, but the supplier seeks vertical integration by offering services like consulting or transportation services. This form can be conceptualized as products + services.

Product oriented PSS. With this form the ownership of the tangible product is transferred to the customer, but the company will provide additional services which are directly related to the product like design and development services or maintenance and support services. This form can be conceptualized as products + services that are integral to the product.

Service oriented PSS. This is the first option which involves a coupled product and services, because this option incorporates services into the product itself. The ownership of the tangible product is still transferred to the customer. However, as an integral part of the offering additional value added services are offered. Examples are Intelligence Vehicle Health Management services.

Use oriented PSS. With this option the focus shifts to the service which is delivered through the product. The ownership of the tangible product is often retained by the service provider. This service provider sells the functions of the product via modified distribution and payment systems. Examples of these systems are pooling, leasing, and sharing.

Result oriented PSS. This option seeks to replace the product with a service. This option ensures that the need for the product, or possession of an individual product, is disposed. A great example are voicemail services, which in turn replaced the need for individuals to own their own answering machine.

Within these 5 forms of product-service systems, 12 different forms of services are identified, which are in turn subdivided into the forms of PSS. Table 10 shows how the 12 different forms are divided into the 5 categories.

Product-service system form	Service forms
Integration oriented PSS	(1) Consulting services (2) Financial services (3) Retail and distribution services (4) Transportation and trucking services (5) Property and real estate services
Product oriented PSS	(6) Design and development services (7) Installation and implementation services (8) Maintenance and support services (9) Outsourcing and operating services (10) Procurement services
Service oriented PSS	(11) Systems and solution services
Use oriented PSS	(12) Leasing services
Result oriented PSS	(13) Replacing the need for a product by shifting complete to a service

Table 10 Product-service system forms (Neely, 2008)

Raddats and Easingwood (2010) - At first, service engagement strategy is when a product-centric business provides services closely linked to its own products. Thereby helping to create differentiation and potentially a service revenue stream. Second, a service extension strategy is very similar to the service engagement strategy. The only difference is that when the services that the services that are offered under the services engagement are also applied to other OEMs' products (Raddats & Easingwood, 2010).The service penetration strategy is when services are delivered on own-brand equipment that helps customers with operational activities they may have previously performed in-house. when product-centric businesses implement the service transformation strategy it means that these companies deliver output-based services in a multi-vendor equipment environment (Raddats & Easingwood, 2010).

Appendix III: Mintzberg's design parameters

This appendix elaborates the design parameters according to Mintzberg. The parameters specialization, formalization, training and indoctrination, unit grouping, unit size, planning and control systems, liaison devices, and (de)centralization are briefly elaborated.

Specialization - In contrast to Pugh et al. (1968), Mintzberg (1979b) specialized the first element into two dimensions, namely into 'scope' and 'depth'. The scope dimension focuses on the number of tasks and the extent of the breadth of these tasks. In other words, are the tasks broad or are these tasks very narrow? The first dimensions is also called the horizontal job specialization, or horizontal job enlargement, depending on if it deals with parallel activities or the opposite. The 'depth' dimension of the specialization is concerned with the control of the work, and is also called vertical job specialization or vertical job enlargement (Mintzberg, 1979b).

Formalization - The definition of Formalization of behaviour by Mintzberg (1979b) corresponds to the definition of Pugh et al. (1968) that is given earlier, referring to the standardization of work processes. However, Mintzberg (1979b) describes how behaviour may be formalized in three ways, namely formalization by job, formalization by work flow, and formalization by rules. In short, formalization by job means that the organization attaches certain behavioural specifications to the job, sometimes in the form of a job description. Formalization by work flow concentrates on the fact that organizations often attach specifications to the work itself. For example, matching specific instructions to different types of orders. At last, formalization by rules implies that the organization may institute rules for multiple situations. These rules may explain who can or cannot do what, where, when, and by whom the employees have to ask for permission. In summum, formalization has the goal to regulate behaviour from the employee (Mintzberg, 1979b).

Training and Indoctrination - In contrary to regulation of behaviour the last aspect of the position design is the specification of the requirements for certain positions. To achieve the specifications companies can design recruiting and selection procedures, they can specify the knowledge and skill level, and companies can establish programs to train and develop potential candidates. However, these intentions try to achieve the same main goal, which is to ensure necessary behaviour that is related to specific positions. Mintzberg (1979b) defines training as "the process by which job-related skills and knowledge are taught, while indoctrination is the process by which organizational norms are acquired (Mintzberg, 1979b, p. 95). From this perspective training is seen as a key design parameter in work, which Mintzberg (1979b) refers to as professional. Furthermore, indoctrination is the label that is used for the design parameter whereby organizations formally socializes with its members in order to achieve intangible benefits (Mintzberg, 1979b).

Unit grouping - The system of formal authority and the construction of the hierarchy of an organization are created by grouping of units. Thus, grouping can be considered as a process of successive clustering. According to Mintzberg (1979) grouping is a fundamental mean to coordinate work in the organization that can have important effects. the first effect of grouping is the introduction of a system of common supervision between positions and units. For this reason, unit grouping is referred to as the design parameter by means of which the coordination mechanisms of direct supervision is incorporated into the organizational structure. The second effect relates to the sharing of common resources, as members or a unit are expected to share the facilities and equipment. As a result of this sharing of resources, it is common that grouping also creates common measures of performance, since the costs of the activities performed with the shared resources can be measured jointly. Another effect of these performance measures is that it further encourages the coordination of activities. The final effect of grouping is that it encourages mutual adjustments, because the sharing of resources and performance measures stimulates the communication between multiple units or members of units. Therefore, it stimulates mutual adjustments (Mintzberg, 1979b).

The grouping of units can be done on the basis of different criteria. The best known criteria for grouping are, based on knowledge and skills, based on work process and function, based on time, based on output (market), based on type of clients and based on geographical region. Furthermore, four basic criteria to select the bases for grouping have been isolated, namely, work-flow interdependencies, in work process, of scale, and in social relationships (Mintzberg, 1979b).

Unit Size - The grouping of units is seen as the first basic issue in the design of a 'superstructure', while the unit size is the second issue regarding this topic. The unit size is split up into two important ways, namely what should be the span of control of a manager, and what shape should the 'superstructure' be? The span of control is defined as "the number of subordinates a supervisor can supervise directly". The span of control of a supervisor can be broad, meaning a large number of subordinates, or narrow, meaning a low number of subordinates. According to Mintzberg (1979) unit size can be driven up by standardization, similarity in the tasks performed in a given unit, the employees' needs for autonomy and self-actualization, and the need to reduce distortion in the flow of information up in the hierarchy. The unit size can be driven down by the need for close and direct supervision, the need for mutual adjustment among complex interdependent tasks, the extent to which the manager of a unit has non-supervisory tasks to perform, and the need for members of the unit to go to the manager for consultation or advice (Mintzberg, 1979b).

Planning and control systems - The unit grouping and size contribute to the building of a 'superstructure'. However, the organizational design is not completed yet. The structure should be supplemented with certain links that standardize output, so-called planning and control systems, and liaison devices that ensure that mutual agreements are coordinated. Planning and control systems regulate output, and behaviour in an indirect way. Two different kinds of planning and control systems can be distinguished, namely systems that focus on the regulation of overall performance, performance control, and systems aimed at regulating specific actions, so called action planning. In general, performance control systems serve the purpose to motivate and measure.

Liaison Devices - On the other hand, action plans are used to specify decisions that call for specific actions. Thus, coordinating work in the functional structure, meaning that it imposes specific decisions and actions to be carried out in specific points in time (Mintzberg, 1979b). However, these planning and control systems do not coordinate the mutual adjustment, which is the purpose of these liaison devices. Liaison devices stimulate contact between individuals and can be included into the formal structure of an organization. Mintzberg (1979) distinguishes four basic types of liaison devices, namely liaison positions, task forces and standing committees, integrating managers, and matrix structure. Liaison positions have a considerable informal power and are established to route direct communication while bypassing the vertical channels. Task forces and standing committees can be split up into task forces, and the standing committee. A task force is a committee formed to accomplish a particular task and then disband, while a standing committee is a more permanent interdepartmental grouping meaning that it meets regularly to discuss subjects of interest (Mintzberg, 1979b, p. 164). An Integrating manager is in fact a liaison position with formal authority. The formal power of an integrating manager shall never encompass the formal power over personnel. However, an integrating manager always has a number of aspects of the decision-making process that go beyond the departments involved. However, these bases for grouping do not contain all the interdependencies. There is one liaison device that is seen as ultimate, namely the matrix structure. By implementing a matrix structure companies avoid choosing on basis of grouping over another. In Appendix V the matrix structure will be elaborated more in-depth. In general, liaison devices are used where the work is complex, horizontally specialized, and highly interdependent (Mintzberg, 1979b).

(De)Centralization - The last two design element, vertical and horizontal decentralization, are linked to the subject of decision making. In literature, the terms centralization and decentralization have been used in many different ways. Centralization in a company occurs when all the decision making power rests at a single point, or in the hands of an individual, in the organization. Decentralization occurs when the decision making power is dispersed among many individuals in the organization. Centralization is seen as the tightest and most hierarchical way to coordinate decision making in an organization, because all decisions are made by one individual and then implemented through direct supervision. Another reason for centralization is the lust for power of certain individuals. However, all decisions cannot be understood by an individual, because of the lack of cognitive capacity and the fact that soft information is difficult to transmit, companies should decentralize in order to make decisions that are more tailored to the situation. With decentralization individuals who understand the specifics can respond in an intelligent way to the occurring situations. It can be stated that decentralization places the power where the knowledge is. Another advantage of decentralization is that is allows companies to respond quickly to local conditions and that it stimulates the motivation of employees, because employees have room to maneuver, decision making power, and room for creative and intelligent solutions (Mintzberg, 1979b). However, centralization and decentralization are pictured as two absolutes. In contrast, Mintzberg (1979b) states that centralization and decentralization have to be seen as two ends of a continuum.

Decentralization is used in three fundamental ways in the literature. At first it is used to describe the dispersal of formal power down the chain of line authority. This is also called vertical decentralization or delegation, which is a common synonym for this type of decentralization. The second way decentralization is used is to address decisional power. This is also called horizontal decentralization, which refers to the extent to which nonmanagers control decision processes. Finally, decentralization is also used to refer to the physical dispersion of services. This type of decentralization has nothing to do with the power over decision making, and therefore only serves to raise confusion. However, decisional powers do not need to be dispersed consistently. Thus, two more kinds of decentralization rise, namely selective decentralization and parallel decentralization. At first selective decentralization means that the power over different types of decisions lies at different places in the organization, while parallel decentralization refers to the distribution of power for many types of decisions to the same place. When a decision process is decentralized it means that the decision maker only controls the making of the choice. The decision maker controls the making of choices, which does not necessarily constitutes tight centralization, because the 'decision maker' loses power to the information gatherers, the advisors, authorizers and executers (Mintzberg, 1979b).

Appendix IV: Dimension overview

In this appendix a summary table of the structural organizational dimensions per author can be found.

Author	Structural organizational dimensions
1. Pugh, Hickson, Hinings, and Turner (1968)	Specialization Standardization Formalization Centralization Configuration – (hierarchy of authority & Span of control) Flexibility
2. Mintzberg (1979)	Job Specialization Behaviour Formalization Training and indoctrination Unit grouping Unit size Planning and control systems Liaison devises Vertical/Horizontal Decentralization
3. Meijaard, Brand, and Mosselman (2005)	Standardization Formalization Specialization Coordination
4. Shahriari, Maleki, Koolivand, and Meyvand (2013)	(de)centralization Complexity Standardization Formalization Flexibility
5. Robbins and Coulter (2015)	Work specialization Departmentalization Chain of command Span of control Centralization & Decentralization Formalization.
6. Daft, Murphy, and Willmott (2014)	Formalization Specialization Hierarchy of Authority Centralization Professionalism Personnel ratios

Table 11 Structural organizational dimensions per author

Appendix V: Mintzberg's Archetypes

Simple structure – has the strategic apex as a key part of the structure and is characterized by a flat structure, which consists of one or a few top managers and an organic operating core. Therefore, the decision making power in a simple structure is centralized and informal. Furthermore the simple structure has little or no technostructure, a few support staff members, and low levels of formalization and departmentalization. With the centralization of decision making and the lower levels of formalization and departmentalization rapid response to changes is the environment is enabled. Most often the simple structure is seen in young entrepreneurial companies (Lam, 2010; Lunenburg, 2012; Mintzberg, 1979b). For a visualization of the simple structure, see Figure 35.

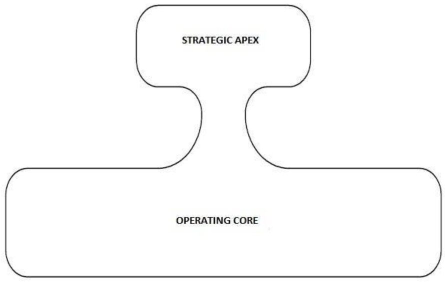

Figure 35 Simple structure

Machine bureaucracy – Is defined by its high levels of standardization, formalization and departmentalization. In contrary with the simple structure, the machine bureaucracy has its technostructure as its key part. Characteristics of the machine bureaucracy are the many routines and procedures, the standardization of work processes, a high degree of job specialization, and a centralized decision making. The span of the control of the management is narrow. As a result, the organization is tall. In other words, there are many levels that exist in the top-down hierarchy of the chain of command. Furthermore, the technostructure and support structure in a machine bureaucracy are large, see Figure 36. The machine bureaucracy is appropriate for companies who act in a stable environment. These organizations operate in a tight vertical structure that has multiple functional grouped departments. This type of organizational structure is advantageous when companies pursue efficiency and economics of scale. A disadvantage of the high levels of specialization is that functional units can have conflicting goals, which may conflict with the general corporate goals (Lam, 2010; Lunenburg, 2012; Mintzberg, 1979b).

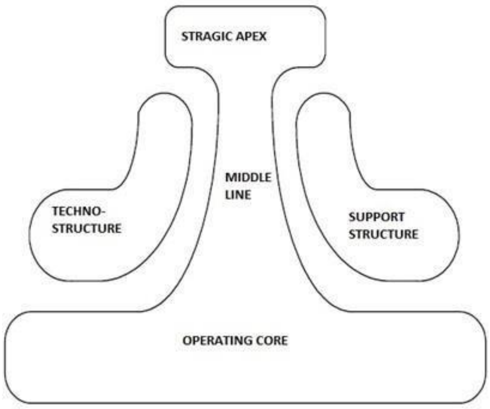

Figure 36 Machine bureaucracy

The professional bureaucracy – is a bureaucratic structure, without being centralized. This structure has the operating core as its key part. Moreover, the standardization of skill is the prime coordinating mechanism. The main difference between the professional and the machine bureaucracy is that professional organizations rely on highly trained professionals. These professionals have a high degree of autonomy. This means that despite the high degree of specialization, decision making is decentralized. The top management is small, and there are a few middle managers. In contrary to the machine bureaucracy, the technostructure is generally small. However, the support structure is rather large because the provide maintenance support for the professional operating core, see Figure 37. The main goals of an professional bureaucracy is to innovate, and to provide high quality services. A disadvantage of the professional structure is the lack of control of the executives at the top, because authority and power are spread down the hierarchy. Nonetheless, professional organizations are complex, with lots of rules and procedures. Most of these professional bureaucracies exist in a complex, yet stable environment (Lam, 2010; Lunenburg, 2012; Mintzberg, 1979b).

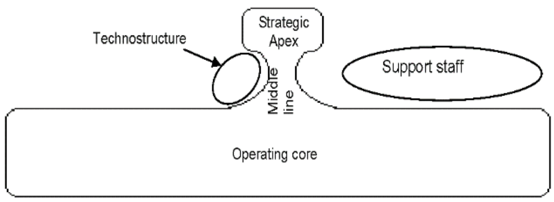

Figure 37 The professional bureaucracy

Divisionalized form – this structure can be described as a market based one, with a central headquarters overseeing multiple autonomous divisions, which have their own structures, make their own decisions, and serve their own markets, see Figure 38. A divisionalized form has the middle line as its key part, and uses standardization of output as coordinating mechanism. As a result of multiple divisions, the decision making is decentralized organic at a divisional level, and there is little coordination between the divisions because each division serves its own markets. Most often large and mature firms, who have a variety of brands, or operate in different geographical regions implement this kind of structure. One of the main benefits of a divisionalized organization is that the line managers themselves maintain accountability and control. The day-to-day decision making is decentralized towards local managers, who ensure the necessary support. One of the disadvantages is the allocation of resources from the headquarters, and duplication of resources and activities. These organizations are generally inflexible and work best in stable and not overly complex industries. One of the main concerns of the headquarters is to come up with some kind of mechanism that coordinates the goals and reporting obligations, in order to stay up to date (Lam, 2010; Lunenburg, 2012; Mintzberg, 1979b).

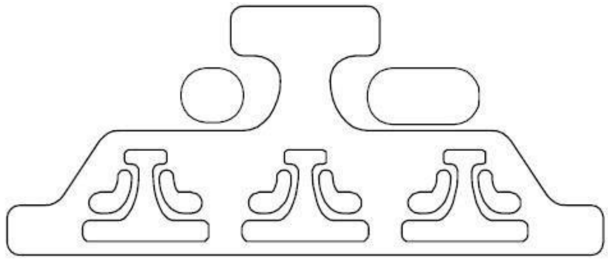

Figure 38 Divisionalized organization

Adhocracy – is a highly flexible project-based organization that has the support staff as its key part. These organizations use mutual adjustment ad coordination mechanism, and is designed to deal with complexity and instability. Decision making power is decentralized and is delegated to places where it is needed, which makes it hard to control. One of the characteristics of adhocracy is innovation and rapid adaptation to changes. As a result, adhocracies have little to no formalization and departmentalization. As a result of innovation as one of the main characteristics, adhocratic organizations often need to break through the established patterns. Therefore, activities are not standardized as well as other forms of structure and tasks. One of the advantages is that problem-solving teams can be rapidly reconfigured and adhocratic organizations can quickly respond to environmental changes. Furthermore, the technostructure is small, because the specialists in adhocracies belong to the operating core of the organization, see Figure 39. However, the support staff is rather large in order to support the complexity. One of the disadvantages of an adhocracy is that there can be a lot of conflicts with authority, power, and control. Moreover, dealing with rapid change is stressful, which makes it hard to find and keep talent within the organization. Typical examples of adhocratic companies are software engineering companies (Lam, 2010; Lunenburg, 2012; Mintzberg, 1979b).

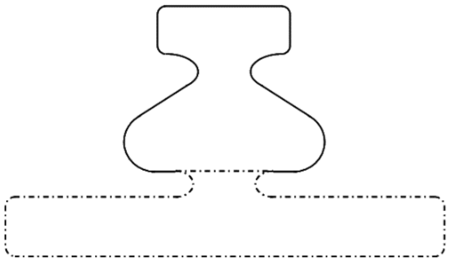

Figure 39 Adhocracy

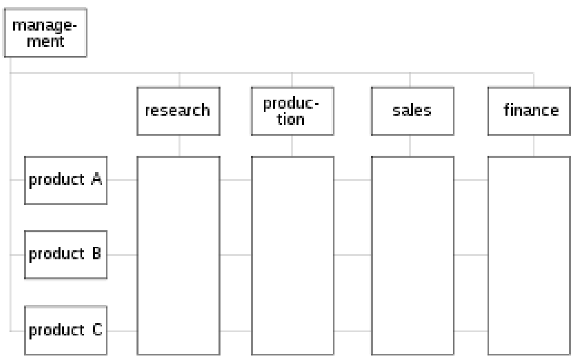

Figure 40 Matrix structure (Robbins & Coulter, 2015)

Matrix structure – Today, Mintzberg's Archetypes are still found in a variety of organizations. However, since the first recognition of the archetypes, several different forms of organizational structures have emerged, including matrix structures. As mentioned, Mintzberg (1979b) sees the matrix structure as the ultimate liaison device, see Figure 40. Daft et al. (2014) state that the matrix structure has been developed to give equal emphasis and attention to product and function, or product and geography. In addition, matrix structures are more likely to be implemented when factors such as technical expertise and innovation are assessed equally important for the organization. According to Ahmady, Mehrpour, and Nikooravesh (2018) a matrix structure is created with the aim of creating a structure that is composed of functional and multidivisional structures. Matrix structures strive for a kind of balance between grouping, in order to achieve the benefits of both. Moreover, matrix structures combine the efficiency of functional structures with the flexibility and sensitivity of a multidivisional structure. Thus, one of the main strengths of a matrix structure is the ability to coordinate complexity in such a way that the organization operates more flexible in response to customer, market or technology needs. Mintzberg (1979b) states that a matrix structure is not suitable for organizations that seek for stability and security. Moreover, the matrix structure has also a disadvantage that is related to the complexity of authority.

The matrix structure can be seen as a dual authority structure, because formal authority comes down from the top and then splits. Hence, in a matrix organization specialists from different functional departments are assigned to work on one or more projects that are led by project managers. Moreover, the employees in a matrix could have two bosses, for example a product manager and a functional manager. This dual hierarchy contradicts the principle of unity of command (Ahmady et al., 2018; Galbraith, 2002; Mintzberg, 1979b). However, Daft et al. (2014) states that the matrix structure can be workable when one or more of the following three conditions are met:

1. There exists a certain *pressure to share scarce resources* across product lines. To be more specific, there have to be pressures in the organization for the shared and flexible use of people and equipment across multiple product lines.
2. There is an *environmental pressures for* two or more *critical outputs*, such as new product launches on a frequent base and in-depth technological knowledge. These pressures require the sharing of power in order to maintain a balance between the functional and divisional structure.
3. The *environmental domain* in which the organization operates is both *complex and uncertain*. A high level of coordination and information processing, both in the vertical and horizontal direction, is required due to high levels of interdependence between departments and frequent external changes.

Furthermore, Mintzberg (1979b) distinguishes two forms of matrix structures, namely the permanent form, where the interdependencies remain relatively stable as well as the people and the units within, and the shifting form, which is aimed at project work wherein the interdependencies as well as the units and the people frequently shift around. These two forms formed the basis for the further development of multiple variations.

Two more variations of matrix structures have evolved, namely the functional matrix and the product matrix. The difference between these two variations is based on the allocation of primary authority. In a functional matrix the primary authority is allocated to the functional bosses, while the product managers coordinate the product related activities. On contrary, in the product matrix the primary authority is allocated to the product managers, whereby the functional managers assign technical personnel and provide expertise where needed (Daft et al., 2014).

Network structure – Another organizational structure that has been established over time is the network structure. The structure is established on the foundation of recognition that organizations cannot be the best in everything in the highly ever changing competitive environment. This type of structure is formed when organizations are faced with rapid changes of technology, are active in a dispersed and specialized market, and have to deal with short product life cycles. The network structure is often viewed as less hierarchical, more decentralized, more flexible structures, and often compared with a divisional structure. In a network structure the organization outsources business functions that can be done better or cheaper by a network partner or third party, in order to focus on what it does best. As a result, the core company is placed in the middle of the network structure. In this structure managers play a vital role during the coordination, because they control the internal as well as external relationships with the partners and third parties. One of the advantages of the network structure is that communication is less siloed and flows freely, which might result in more opportunities for innovation. A disadvantage of this type of structure is that it gets more spread out. As the network organization grows it becomes more difficult to control the network of partners and third parties. Furthermore, it is harder for the organization to control the overall quality of operations (Ahmady et al., 2018; Galbraith, 2002; Robbins & Coulter, 2015).

Virtual structure – An even more advanced and modern form of the network structure is the virtual structure. The virtual structure is made up of a core company who contracts specialists to work on opportunities that arise. Since the virtual organization hires specialists when opportunities arise, they can deliver superior total value to the customers, because during the selection process they can choose the parties that best produce the other parts of the total solution. Like network organizations, the virtual organization consists of independent companies that focus on their core activities and outsource multiple non-core activities. Within the virtual structure, communication with the independent organization is of crucial importance, partly because the organizations have to work together if it were one organization to deliver the superior value. As a result, virtual organizations enter into relationships with various companies such as channel partners, suppliers and sometimes even competitors. The great advantage of a virtual organization is that it is very flexible and eliminates hierarchical roles and costs related to production and housing. However, the focus within the virtual organization should be on coordinating, controlling and selecting partners that make it possible to excel (Galbraith, 2002; Mathieu, 2001; Robbins & Coulter, 2015).

Appendix VI: Trend explanation

In this appendix the underlying trends are explained into more detail. As known, Company-X operates in various markets worldwide. Each of these markets has its own dynamics. In the year 2017, the management of Company-X identified three trends that are gaining more strength in the individual markets served by the diverse business units.

Appendix VII: Beat establishment

In this appendix, the transcripts of the two interviews can be found. These interviews were conducted in Dutch to overcome certain language-related mistakes. The transcriptions are also in Dutch and some sentences are hard to read because they are literally transcribed from the sound recordings. The focus of this interview was to answer the following question:

"What are the reasons for Business unit-Y to switch from B2B to B4B?"

The coding schemes consist of the open codes that are used, the description of these open codes, and the quotes from the interviews associated with the subject in question. During the coding of these interviews open and axial coding techniques have been used to identify the interrelated reasons for the establishment of BEAT (Bryman & Bell, 2015; Yin, 2017).

Axial codes based on the open codes.	
Open codes	Axial codes
Customer reassurance *Respond to customer needs* *Relieve of customer problems* *Frustration*	Customer facilitation as a service
Feedback loop *Distance to the market* *Information need* *Customer mismatch* *Frustration* *Pay for use*	Knowledge gap
Corporate values *Value proposition* *high-end customer focus* *prediction* *Recurring revenues* *Independency* *Time as a factor*	Corporate focus and policy
Digitalisation *Outsourcing movement* *Cloud market trend* *Technology maturity*	Global market trends

Table 12 Axial codes BEAT establishment

Appendix VIII: Interview schemes

Within this appendix the interview questions, construct definition translations and both the tools can be found. However, the text is in Dutch in order to decrease the language barrier. Furthermore, the translation of the construct definitions has been added to the interview scheme in order to avoid any errors of interpretation during the interviews.

Interview vragen Organisatiestructuur.

In het interview zal er onder andere worden gevraagd om de organisatiestructuur te beschrijven aan de hand van begrippen. Deze begrippen zijn allen gerelateerd aan de dimensies van een organisatiestructuur of factoren die invloed hebben op bepaalde keuzes. Uitgebreidere definities van deze begrippen zijn te vinden op de laatste pagina.

Servitization: Servitization is het proces waarbij dienstverlening een steeds grotere rol krijgt in het businessmodel van maakbedrijven. Service verandert van een kostenpost in een kans om de klant beter van dienst te zijn, en zo extra omzet te genereren.

Beschrijving marktgroep.

1. Kunt u een korte beschrijving geven van de marktgroep?
    a. Strategy, missie en visie
    b. Wat is de rol van services in de marktgroep en hoe is deze rol tot stand gekomen?

De markt.

2. Hoe zou u de markt beschrijven aan de hand van kenmerken van de markt betreffende de structuur, complexiteit en competitie?

Organisatiestructuur.

1. Heeft de marktgroep het servitization proces doorlopen? Waarom wel/niet?
    a. Kunt u een korte beschrijving geven over de services die worden aangeboden?
2. (Hoe zag de 'oude' organisatiestructuur eruit? – *structuur beschrijven/doorvragen a.d.h.v. onderdelen uit de tabel.)* – **Vraag staat nog ter discussie**

(De)centralization *Decentralisatie*	Commitment (managerial/employee) *verbintenis*	(Cross-functional) Communication *(Interfunctionele) communicatie*
Culture *Cultuur*	Departmentalization *departmentalisatie*	Flexibility *Flexibiliteit*
Formalization *Formalisering*	Hierarchy (of Authority) *Hierarchie*	Infrastructure *infrastructuur*
Responsibilities *Verantwoordelijkheden*	Specialization *specialisatie*	Synergies *synergie*

3. Is er structureel iets veranderd gedurende het servitization-proces betreffende de organisatiestructuur?
4. Kunt u een beschrijving geven van de huidige organisatiestructuur? Eventueel uittekenen? – *structuur beschrijven/doorvragen a.d.h.v. onderdelen uit de tabel.*

(De)centralization *decentralisatie*	Commitment (managerial/employee) *verbintenis*	(Cross-functional) Communication *Interfunctionele communicatie*
Culture *cultuur*	Departmentalization *departmentalisatie*	Flexibility *Flexibiliteit*
Formalization *Formalisering*	Hierarchy (of Authority) *Hierarchie*	Infrastructure *infrastructuur*
Responsibilities *Verantwoordelijkheden*	Specialization *specialisatie*	Synergies *synergie*

5. Is de organisatiestructuur in lijn met de voerende strategie?
6. Wat zijn de voor-en nadelen van deze organisatiestructuur?
7. Welke factoren zijn belangrijk om een verandering in de organisatiestructuur succesvol te maken/houden?

Valkuilen wanneer **wel** geservitiseerd:

8. Heeft u valkuilen ervaren tijdens het servitization proces betreffende de organisatiestructuur?
    a. Zo ja, welke valkuilen?
9. Heeft u veranderingen doorgevoerd in de organisatiestructuur om de valkuilen te omzeilen/overkomen?
    a. Speciale task forces? Andere indelingen in teams, bevoegdheden?
10. Hebben deze veranderingen het gewenste effect op de servitization performance gehad?
    a. Financial
    b. Non-financial

Valkuilen wanneer **niet** geservitiseerd:

11. Welke valkuilen zou u verwachten tijdens het servitization proces betreffende de organisatiestructuur?
12. Welke veranderingen zou u doorvoeren in de organisatiestructuur om de valkuilen te omzeilen?

---

13. Welke ontwikkelingen ziet u/voorspelt u in uw markt m.b.t. servitization waardoor er veranderingen in de organisatiestructuur zijn/worden aangebracht?

14. **Afsluitende vraag**: Wanneer u de keus krijgt om opnieuw een organisatiestructuur te ontwikkelen om een nieuw product as a service aan te kunnen bieden, zou u deze SBU dan integreren of separeren van de huidige marktgroep? Waarom?

Hierarchy (of Authority): Beschrijft wie aan wie rapporteert en de span of control voor elke manager. De hiërarchie is gerelateerd aan de span of control (het aantal medewerkers dat rapporteert aan een leidinggevende).

(De)centralization: Verwijst naar het hiërarchische niveau dat beslissingsbevoegdheid heeft. Wanneer de besluitvorming op het hoogste niveau wordt gehouden, wordt de organisatie gecentraliseerd. Wanneer besluiten naar lagere organisatieniveaus worden gedelegeerd, wordt het gedecentraliseerd.

Departmentalization: Is de wijze waarop verdeelde taken worden gecombineerd en aan werkgroepen worden toegewezen. Taken kunnen worden gecombineerd in afdelingen op basis van functie, proces, product of dienst, klant en geografie.

Culture: De onderliggende set van kernwaarden, overtuigingen, inzichten en normen die door werknemers worden gedeeld. Deze onderliggende waarden kunnen betrekking hebben op ethisch gedrag, betrokkenheid bij medewerkers, efficiëntie of klantenservice, en ze bieden de lijm om de leden van de organisatie bij elkaar te houden.

Flexibility: De mogelijkheid om te veranderen of gemakkelijk te worden veranderd, afhankelijk van de situatie.

(Cross-functional) Communication: (het betrekken van mensen of afdelingen die verschillende soorten werk voor hetzelfde bedrijf doen) communicatie is de uitwisseling van informatie en de uitdrukking van een gevoel dat kan leiden tot begrip.

Synergies: De gecombineerde kracht van een groep dingen wanneer ze samenwerken die groter is dan het totale vermogen dat door elk afzonderlijk werken wordt verkregen.

Commitment (managerial/employee): De bereidheid om je tijd en energie te geven aan iets waar je in gelooft, of een belofte of vastberaden beslissing om iets te doen.

Infrastructure: Het geheel van voorzieningen dat nodig is om een organisatie goed te laten functioneren. Dit verwijst tevens naar de instrumenten, technieken en acties die worden gebruikt om ‘inputs’ om te zetten in ‘outputs’ en om kennis en informatie te verzamelen en te verspreiden.

Formalization: Het vertrouwen op schriftelijke documentatie in de organisatie. Deze documentatie heeft betrekking op procedures, functiebeschrijvingen, voorschriften en beleidshandleidingen.

Responsibilities: Een gezaghebbende positie over iemand te hebben en de plicht om ervoor te zorgen dat bepaalde dingen worden gedaan.

Specialization: De mate waarin organisatorische taken zijn onderverdeeld in afzonderlijke functies. Als de specialisatie uitgebreid is, voert elke medewerker slechts een beperkt aantal taken uit.

Servitization Readiness.

48 vragen verdeelt over 3 service (capability) gerelateerde organisatorische factoren, namelijk:

- Capabilities for Service Development
  - Sensing
  - Seizing
  - Reconfiguring
- Capabilities for Service Deployment
  - Digitization
  - Customization
  - Network Management
- Service Orientation of Corporate Culture
  - Management Values
  - Management Behaviour
  - Employee Values
  - Employee Behaviour

De vragen dienen te worden beoordeeld op een schaal van '1 = volledig oneens tot 7 = volledig eens'. De 'Average score' bereken ik aan het einde van de vragenlijst per onderdeel. Deze scores zullen uiteindelijk verwerkt worden in een radarplot-diagram. Omdat het verslag in het Engels uitgewerkt dient te worden, zullen de vragen in het Engels worden gesteld.

The relationship-management assessment tool.

Een uitgebreid literatuuronderzoek is uitgevoerd om 10 elementen op het gebied van relationship-management te identificeren. Deze elementen werden aangevuld met informatie die werd afgeleid uit diepte-interviews. Ieder element heeft 11 schaalniveaus, variërend van '0 = minimumniveau, onvolwassen en eenvoudig tot 10 = maximum, volwassen en goed gemanaged'.

Niet ieder element van deze tool zal worden gemeten omdat deze niet (in)direct gelinkt kunnen worden aan servitization en/of een organisatiestructuur. De elementen die worden behandeld zijn gekozen omdat zij uit de literatuur naar voren komen en op een bepaalde manier invloed hebben op de organisatiestructuur. Tevens zijn sommige elementen niet behandeld omdat deze met de 'servitization readiness tool' zijn behandeld. De volgende elementen zullen worden behandeld:

- Customer strategy
- Customer-interaction strategy
- Brand strategy
- Value-creation strategy
- Culture
- Organization
- Information technology
- Knowledge-management process
- People

Het is de bedoeling dat de elementen worden beoordeeld aan de hand van de huidige stand van zaken binnen de marktgroep. Deze scores kunnen uiteindelijk worden gebruikt om een GAP te vinden tussen de gewenste situatie en de huidige situatie. De scores zullen uiteindelijk in een radarplot-diagram worden weergegeven.

Allereerst zullen de vragen betreffende 'servitization readiness' worden behandeld. Hierna volgen de elementen die betrekking hebben op 'relationship-management'.

7-point scale: 1, Entirely disagree; 2, Mostly disagree; 3, Somewhat disagree; 4, Neither agree nor disagree; 5, Somewhat agree; 6, Mostly agree; 7, Entirely agree

- Don't fill in the average scores

Service Orientation

Service Orientation of Management values

Our management…

1.	*Recognizes services as a lasting differentiation strategy*	/7
2.	*Considers the combination of products and services as a potential way to improve profitability*	/7
3.	*Uses services to reduce comparability of different suppliers' offerings*	/7
4.	*Aims to exploit the financial potential of services*	/7
5.	*Sees services to compensate fluctuating product sales*	/7
6.	*Considers services as highly profitable*	/7
Average score		/7

Service Orientation of Management behaviour

Our management…

7.	*Empowers employees to respond to a broad range of customer problems*	/7
8.	*Coaches employees to behave in a service-oriented way*	/7
9.	*Sets rewards for service-oriented employee behaviour*	/7
10.	*Supports employees for solving customer problems*	/7
Average score		/7

Service orientation of employee values

Our employees…

11.	*Recognize the financial potential of services*	/7
12.	*Try to compensate fluctuating product with service sales*	/7
13.	*Consider services as highly profitable*	/7
14.	*Use services to augment the product offering*	/7
15.	*Use services to improve the customer relationship*	/7
16.	*Use services for selling more products*	/7
Average score		/7

Service orientation of employee behaviour

Our employees…

17.	*Serve customers as a reliable troubleshooter*	/7
18.	*Serve customers as a performance enabler*	/7
19.	*Serve customers as a trusted adviser*	/7
20.	*Fulfill the role of problem solvers*	/7
Average score		/7

Service Deployment Capabilities

Digitization

Our IT system allows us to integrated access to the following:

21.	*All customer-related data (e.g. service contracts, feedback)*	/7
22.	*All order-related data (e.g. order status, handling requirements)*	/7
23.	*All production-related data (e.g. resource availability, quality)*	/7
24.	*All market-related data (e.g. promotion details, future forecasts)*	/7
Average score		/7

Mass Service Customization

25.	*We are highly capable of large-scale product-service customization*	/7
26.	*We can easily add significant product-service variety without increasing costs*	/7
27.	*We can customize product-services while maintaining high volume*	/7
28.	*We can add product-service variety without sacrificing quality*	/7
29.	*We can adjust our process design according to customer demand without significantly increasing costs*	/7
30.	*We can adjust our product-service design according to customer demand without significantly increasing costs*	/7
Average score		/7

Network Management

31.	*We analyze what we would like to achieve with each partner*	/7
32.	*We remain informed about the goals, potential and strategies of our partners*	/7
33.	*We determine in advance possible partners with whom to discuss the building of relationships*	/7
34.	*We appoint coordinators who are responsible for the relationships with our partners*	/7
35.	*We regularly discuss with our partners how we can support one another in our success*	/7
Average score		/7

Service Development Capabilities

Sensing service opportunities and threats

36.	*We focus on identifying service opportunities to differentiate our total offering*	/7
37.	*We observe customer needs*	/7
38.	*We observe competitors' service offerings and behaviour*	/7
39.	*We react quickly to competitors' service activities*	/7
Average score		/7

Seizing service opportunities

40.	*We can make quick and timely decisions to create a new dominant design of the total offering*	/7
41.	*We articulate intended strategies early and clearly to direct information-gathering and filtering mechanisms and focus management attention*	/7
42.	*We have the capacity to satisfy customers' expressed needs*	/7
43.	*We can make tactical choices on bundling and charging for goods and services (or charging for them separately)*	/7
44.	*We have the capacity to commercialize new offerings and communicate changes to the customer*	/7
Average score		/7

Reconfiguring assets and processes

45.	*We are able to turn service activities into a professional business*	/7
46.	*We are able to turn service activities into a profitable business (whereby services are either embedded in product prices or charged separately)*	/7
47.	*We have procedures and routines to minimize costs related to new service activities*	/7
48.	*We can overcome internal resistance and conflicts*	/7
Average score		/7

Relationship-management tool.

- Each element will be listed on a different page in order to filter out confusion.
- Each element needs to be scored on the basis of the current state of affairs within the business unit.
- If an element is outsourced or not relevant for your department, please draw a line through the element and give the lowest possible score. (e.g. ~~Element 1: Customer strategy~~.)

Element 1: Customer strategy.

☐	*We sell our goods to customers who are willing to buy. We have no criteria in place to select customers.*
☐	*We have a customer strategy to select customers. Someone in our organization is responsible for this strategy.*
☐	*We define customer strategies, which are mainly focused on acquiring new customers.*
☐	*We base our customer strategies primarily on the needs of prospective and existing customers, rather than on (potential) customer-lifetime value.*
☐	*We analyze the lifetime value of individual customers to understand their importance to our organization. Different approaches including for example activity-based costing are used to calculate the value of individual customers.*
☐	*We rank customers by their value in order to define customer segments. Customers with similar lifetime value are allocated to the same customer segment.*
☐	*We set clear business objectives for each customer segment. We develop a corresponding value proposition that is consistent with these objectives including, for example, a selling and pricing strategy. In each segment customers have the same lifetime value, but are differentiated from each other by their needs.*
☐	*We build and develop relationships with our most valuable customers. We continually analyze their potential, and we take actions to transform unprofitable customers into profitable ones.*
☐	*We retain our most valuable customers by understanding loyalty drivers and by introducing appropriate value-adding propositions. Moreover, we know why some customers defect and how to win these customers back. We increase our customer retention by offering value-adding propositions.*
☐	*We meet the specific needs of our customers, and our value propositions regularly exceed their expectations. We build unique relationships with our most valuable customers. Our customers prefer our organization to do business with rather than our direct competitors because we excel in creating value-adding opportunities. We review our customer strategy continually*
☐	*We develop excellent customer strategies, which create customer trust and commitment, and drive the growth in our profitability. We are the number one strategic supplier of our most valuable customers. In order to develop the most value-adding goods and services in the marketplace we collaborate closely with our customers to exchange knowledge.*

Element 2: Customer-interaction strategy.

☐	We provide contact details so our customers can ask for information. We interact only rarely with our customers, and this interaction is not coordinated between the different levels and functional departments in our organization.
☐	We make an inventory of existing customer-touch points. We map these touch points for different processes including information/communication, transaction, distribution, and service. The characteristics of each touch point are described.
☐	We analyze and understand customer-touch points in terms of their differences, functionalities, importance, costs, and the business processes behind.
☐	We define a customer-interaction strategy, which is aligned with our customer strategy. This means that we serve customers through appropriate channels. Low-value customers are served through low-cost channels, for example e-mail rather than face-to-face interaction.
☐	We base the customer-interaction strategy primarily on our customers' needs. Each interaction with a customer has a clear objective, but we do not systematically capture a record of these interactions using an information system.
☐	We minimize our customers' inconveniences by developing interaction channels. This helps us to provide information, resolve problems and complaints, distribute goods and services, and make transactions possible (e.g., order entry and online payment). However, these customized interactions are still not well coordinated.
☐	We have employees whose responsibility is to capture customer information provided by each customer interaction. Every customer contact is recorded to get more insight into this customer's preferences and needs. We know when and how our customers want to interact with us.
☐	We track the effectiveness of our interaction channel(s), and use customer feedback for improvements. Our employees in all functional areas know how best to respond quickly to a customer request
☐	We coordinate and manage across all levels and functional departments in the organization each single customer interaction. We achieve consistency in customer interactions.
☐	We review continually our customer-interaction strategy. Interaction channels are used in an effective and efficient way to avoid waste of resources.
☐	We add value through our customer-interaction strategy. This influences our customers' behaviour so that they choose our organization. All channel opportunities are developed to create channel synergy. Our customer-interaction strategy is translated into competitive advantages.

Element 3: Brand Strategy.

☐	*We describe the brand positioning for the goods that our business unit is producing*
☐	*We have a basic understanding, within our business unit, of our brand image and the attractiveness our goods relative to that of direct competitors. We learn this through market research (ad hoc qualitative market research).*
☐	*We describe the brand positioning for our goods. This brand positioning is based on the translation/amplification of the brand positioning for our goods.*
☐	*We have a good understanding, within our business unit, of our brand image among a defined customer-target group and the attractiveness our goods relative to that of direct competitors. We learn this through regular qualitative market research*
☐	*We, the management and all people in direct contact with the market, know, understand, and apply the brand positioning. This understanding is consistently deployed in communication briefings.*
☐	*We translate the brand positioning into the brand promise to the customer and other targeted stakeholder groups. This promise is relevant, perceivable, and attractive to the targeted groups, and is distinctive from that of our competitors.*
☐	*We develop all communications (i.e., from packaging over backing cards and TV spots to public relations campaigns) using the brand positioning. We perform regular checks relating to consistency*
☐	*We regularly measure customers' and other targeted groups' awareness of our brand. We do this through all relevant attributes in a quantitative way. Gaps between actual and targeted brand image are identified. Our brand's relative position versus that of our competitors' brands is consistently checked.*
☐	*We formulate a plan in our business unit to close the gap between actual and targeted brand image. This plan also guides the definition of our product portfolio, distribution/sales channel strategy, and market-introduction policy needed to realize the targeted brand positioning in the marketplace.*
☐	*We make the brand positioning an integral part of our business plan. We have validated the plan as being effective in the marketplace in driving a profitable growth*
☐	*We have achieved maximum, benchmarked awareness of our brand promise. The brand positioning has been validated as being capable of achieving long-term profitable growth for our company.*

Element 4: Value-creation strategy.

☐	*We sell goods that meet customers' requirements. There are many competitors in the market who are able to offer the same goods at competitive prices.*
☐	*We base our competition for market share mainly on the quality of our goods. The marketplace is characterized by price competition, which results in small margins*
☐	*We focus on selling the features of our goods, as well as the quality and the services that are related with those goods. We do this with a profit*
☐	*We are aware that selling goods and related services only is not enough to win valuable customers*
☐	*We use market researches and value models for gaining more insight into customer requirements*
☐	*We identify added-value opportunities by understanding our customers' specific needs and preferences. We are one of our customers' preferred and selected suppliers.*
☐	*We can provide the best offering in the marketplace by excelling in specific value-adding activities*
☐	*We formulate value propositions that meet specific customers' requirements. These propositions create added-value benefits and are superior to those of our competitors. This makes it possible to apply premium prices for our goods and services*
☐	*We develop comprehensive value-adding propositions that our customers trust. These propositions are the reason why we can change from short-term transactions into long-term relationships with profitable customers. Customer value comes in many forms and is beyond the immediate value of purchased goods. Services, convenience, speed, ease of access, responsiveness, trust, integrity, and education are all part of customer value.*
☐	*We dominate the market by improving our value-adding activities continuously. Customer satisfiers and dissatisfiers are tracked all the time. We seek actively opportunities to create more value by regularly analyzing the results of customer satisfaction surveys*
☐	*We are acknowledged as the leading company, and for being unique, in the market. Our profits result from creating and delivering superior, innovative solutions to our customers instead of selling generic goods and services to them. We have the expertise and knowledge of our customers' value chains to help them source, produce, and deliver effectively to their own customers. It is difficult, if not impossible, for our competitors to copy our capabilities*

Element 5: Culture.

☐	*We request our sales people to focus on single sales rather than on customer retention. The focus is on short-term sales targets.*
☐	*We are paying more attention to goods and competitors than to customers. We lack an understanding of our customers' needs and wants*
☐	*We are aware of the necessity of a customer-focused mindset, as well as an organizational change for building relationships with our most valuable customers*
☐	*We, employees or departments, especially sales people, act in a more customer-centric way. There is hardly any internal resistance to organizational or cultural change*
☐	*We delegate clear responsibility and authority to leaders in our organization in order to realize a customer-focused culture. We request our leaders to understand the market, and to show determination. Their style and methods of managing in turn are encouraging a customer orientation, as well as our employees' service mindedness*
☐	*We focus primarily on customers and long-term relationships rather than on goods and short-term transactions. We react quickly to customer requests and demands*
☐	*We adapt the way of working in our organization: we now anticipate rather than react to our customers' requests and demands*
☐	*We constantly try to meet customers' expectations by delivering appropriate goods and services and by solving their problems quickly. Our employees are competent to communicate in a customer-oriented way, and possess the required interaction skills.*
☐	*We focus on creating value-adding opportunities for our customers. Our employees are committed and dedicated to satisfying our customers. Employees feel responsible for the end result and act with the customer in mind.*
☐	*We constantly think from the customer's point of view in order to improve business performance. We emphasize on seeking new, innovative ways of working to serve our customers individually. Also, we continuously try to exceed customers' expectations and requirements.*
☐	*We install a customer-focused culture in our organization. Customer focus and commitment are parts of our corporate vision and mission. Honesty and openness characterize the way of working. We involve in an early stage our customers and suppliers in product and service development, and continue to monitor external developments*

Element 6: Organization.

☐	*We see the functional departments in our organization as autonomous units. There is a lack of communication between departments.*
☐	*We manage customer relationships only through the sales department*
☐	*We understand how the organizational structure is designed, and how this structure affects the performance of our customer management and other activities*
☐	*We introduce a number of contacts between the selling and buying parties to replace the traditional relationship between sales and purchasing departments. These contacts represent the marketing, finance, logistics, and information-technology departments*
☐	*We manage the relationship with our customers through different departments in our organization. Also, we define procedures to manage customer complaints. The accountabilities and procedures for several customer processes are written down clearly*
☐	*We ensure that functional departments collaborate to meet our customers' needs and wants. Communication between departments has been improved, but it is still not optimal. We have a dedicated key account manager to coordinate the development of our customer relationships*
☐	*We delegate the coordination and management of customer relations to middle and senior management. Their role is to help customer-facing employees by supporting, coaching, and providing required resources.*
☐	*We adapt the organizational structure by setting up cross-functional teams. The goal is to bring the specialized knowledge of different functions and task groups together to develop goods and services that meet our customers' needs and wants*
☐	*We make sure that our employees are strong team players in cross-functional teams. Established teams have the authority to set coordinated value-adding customer strategies, and are able to maximize returns on customer information*
☐	*We are a flexible organization that supports a customer-oriented decision making, and have the flexibility to anticipate and respond to our customers' value-adding requests*
☐	*We manage consistently across different organizational levels and functional departments our customer relationships. The internal communication works seamlessly and smoothly among customer facing employees, as well as between them and the rest of the organization. Customers perceive us as a well-organized company*

Element 7: Information Technology.

☐	*We usually work with stand-alone systems, for example database marketing. There is no structured way of working to collect and use customer data*
☐	*We set up separated information-technology systems in our organization to hold important information about our customers such as transactions information. Some data is collected on paper rather than in an information-technology system.*
☐	*We determine which data is required to support customer-management processes. Such data includes historical data for customer transactions and customer contacts. This data is collected within a particular business unit using several information-technology systems. We understand how technologies will support our business processes, and have defined system requirements. We prioritize analytic needs of our organization before making major information-technology investments*
☐	*We design and build a common data store such as a data warehouse or data mart. Data fragmentation, however, still occurs.*
☐	*We define in detail terms in databases to avoid differences in meanings by departments or user groups. The visibility and accessibility of customer data (obtained from a variety of customer-touch points) among customer-facing employees and other employees have been increased, but integration of customer-contact channels is still not fully realized*
☐	*We avoid data fragmentation problems by consolidating all customer information collected from various customer-contact channels: face-to-face such as sales representatives, fax, mail, telephone, E-mail, and Websites to allow E-technology applications such as online billing, order entry, and configuration. E-technology also makes it possible for our customers to validate or refresh supply chain data or customer data. They can do this themselves, and more frequently and accurately.*
☐	*We integrate front- and back-office systems. Front-office applications such as portals pull information from the back-office system such as enterprise resource planning systems. Data is sourced from our customers' legacy systems and external data sources.*
☐	*We realize the integration of customer-contact channels. It allows the sharing and usage of information about our customers, which support activities such as sales force automation, customer contact, campaign management, customer-service management, and order and supply-chain management. Before analysis, customer data must be cleaned (e.g., eliminating duplicated or irrelevant data), grouped, and transformed into a consistent and usable format. Someone in the organization is given the responsibility for the quality and the management of data within the context of a single business function or process. The quality of the data is determined by the following criteria: accuracy, consistency, reliability, accessibility, and completeness*
☐	*We develop insights into our customers by analyzing customer and market data extracted from our databases. Information-technology system tools allow our organization to analyze and look for patterns in customer data. These information-technology system tools, for example data mining, are able to identify profitable customers and their characteristics; predict customer-buying behaviour (by purchase analysis, interaction/channel analysis, customer-response analysis, and market analysis); evaluate marketing-campaign effectiveness; provide opportunities for cross and up selling; estimate customers_ potential; and reveal factors that cause customers to remain loyal to our organization*
☐	*We use innovative technologies including, for example mobile devices, to update customer data in real time to provide each system and channel with the most recent customer information. This way of working reduces the time to market. Our selection of technologies is validated by a customer-oriented process.*
☐	*We achieve an integrated, cross-functional, multiple-channel (contact channel) view of our customers. We achieve this by the integration of consistent customer data and applications. This comprehensive customer intelligence allows us to manage each customer relationship efficiently and effectively, and to grow our business. The integration of information systems is extended to our key partners and suppliers*

Element 8: Knowledge management and Learning.

☐	*We are ignorant about the relevance of knowledge management*
☐	*We understand the role and importance of knowledge management in terms of developing business strategies, goods, and services. Some knowledge is captured relating to customer behaviour and knowledge of customers relative to product use.*
☐	*We identify sources that generate data, information, and knowledge. However, there is no structured way to manage and leverage knowledge*
☐	*We map the process of knowledge creation; the knowledge is about business markets, business processes, customers, and competitors. Incentives like motivation, reward, and recognition are provided to encourage the leveraging and generating of knowledge*
☐	*We define procedures to instill knowledge into our organization. We extend across the organization a network to connect people to each other, linking 'knowledge seekers' with 'knowledge providers'. This enables collaboration, application of organizational learning, and sharing of best practices*
☐	*We ensure that our employees increase their knowledge through continuous learning. This is realized through participation in training programs*
☐	*We facilitate knowledge management using information-technology systems. This allows managing and sharing of valuable knowledge across the organization. Implicit knowledge is transferred into explicit knowledge and vice versa. We possess the knowledge to create value-adding activities for our customers.*
☐	*We apply and re-use knowledge to accelerate learning processes. Shorter time to market and reduced integral costs are one of the results of well-managed knowledge.*
☐	*We create sustainable competitive advantage by creating knowledge assets, which contribute to improvements of competences within our organization. Knowledge is regularly reviewed for validity, and is updated when it is necessary*
☐	*We selectively benchmark organizations and participate in forums for development of new knowledge. Knowledge management is a part of our organization's culture*
☐	*We base our strategies on knowledge creation and management. Creating and exploiting knowledge as core strength of our organization allow us to set the pace of change in technologies, goods, applications, and marketplaces*

Element 9: People.

☐	*We have a high employee turnover in our organization. Negative effects including lack of knowledge of customer details and loss of information are visible.*
☐	*We understand the essence of employee satisfaction and commitment, which is correlated with customer retention.*
☐	*We identify and describe different roles in our organization including competencies and accountabilities, which affect the customer's experience. This includes people in departments such as product, marketing, sales, services, finance, administration, operations, and technical support.*
☐	*We select and recruit people with the right skills and orientation in accordance with job descriptions. Appropriate leadership and customer management competencies are essential characteristics for customer-facing employees. These competencies are requirements in our job descriptions. A customer-focused mindset is part of recruiting and training programs*
☐	*We reward our employees based on their individual performance and productivity. We make customer-focused behaviour a significant part of performance appraisal criteria, and ensure that incentives and rewards encourage a customer-focused behaviour*
☐	*We ensure that our employees understand their roles and possess the basic skills and knowledge to identify our customers' needs and preferences that are of value to them.*
☐	*We regularly assess the skills of our employees' to identify competency gaps. Development and training plans are implemented to enhance customer-management skills*
☐	*We require each employee to take whatever action appropriate to ensure the satisfaction of our valuable customers. A certain degree of autonomy in decision making allows our employees to manage customers*
☐	*We increase the retention of our skillful employees. We seek to reinforce customer loyalty, to reduce costs of hiring and training, and to increase productivity. Our experienced employees deliver high-service quality at low costs. Our employees possess the capability to create value-adding activities for our customers*
☐	*We ensure that our employees have a sound market sensing, an ability for understanding our customers (show empathy), and a capability to establish, maintain, and enhance customer relation- ships by gaining their trust and respect. Our employees are able to win concessions without damaging customer relationships. Also, they have excellent skills like business and product knowledge to convince customers to select our organization*
☐	*We, our organization and our employees, are acknowledged by our customers as the most careful, knowledgeable, and skillful professionals to trade with. Our employees understand the difference between added-value and value-adding activities. Employees in our organization are our most valuable assets*

_______________________ _________

Name participant ***Date***

Appendix IX: Interview transcripts

Every interview has been transcribed into Dutch, where after analysis took place. However, in order to limit the size of the document all transcriptions can be found in an attached file.

Appendix X: Interview Drawings

These drawings have been deleted due to confidentiality.

Appendix XI: Transcription tables

This appendix contains summary tables of the interview transcriptions. Each table contains codes used during the analysis of the interview transcripts. Behind each code are related parts of text that have been used to summarize the essence of the results chapter. Next, for each structural dimension key phrases are summarized from each interview in a table. These tables served as a starting point when structuring the results. However, these tables have been deleted due to confidentiality.