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**Literature review on micro and macro factors of change in servitization
- How could companies facilitate the change towards digital servitization?**

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ABSTRACT

Research and literature on servitization have expanded greatly in the past years. This study focuses on providing systematic literature review of the micro and macro factors of change in servitization to find solutions for companies to facilitate the change towards digital servitization. This systematic review classifies equally environmental and organizational qualities from the servitization research and is conducted from descriptive sample of 95 articles covering digital servitization and organizational change.

The review results indicate that extensive investments required for digital servitization demand substantial growth of value creation and appropriation. Furthermore, the implementation of digitalization obliges to invest in additional capabilities and resources. There are also various micro and macro level factors that need to be acknowledged and taken into consideration as they may all affect the servitization change process in different ways. To facilitate the digital servitization change process, attention needs to be paid to value creation, planning and analysing, management, capabilities and resources, monitoring, network, and stakeholders with the additional factors concluded in this research. These findings have potential to provide beneficial insights both for the companies in the path of servitization and for the research community by providing a novel literature review with perceptive future research ideas of the field and beyond.

KEYWORDS: Service transition, Servitization, Digital servitization, Change management, Organizational change, Micro-macro links, Systematic literature review

1. INTRODUCTION

1.1. Motivation for the study

The theoretical part of servitization has developed to be very significant theme for researchers and business society (Díaz-Garrido, Pinillos, Soriano-Pinar, & García-Magro, 2018). The leading firms have begun to change their strategic attentions for solution and service offerings instead of merely offering products to find a source of competitive advantage in the increase rivalry of the markets (Brady, Davies & Gann 2008; Díaz-Garrido et al., 2018). The key motivators of the servitization are that services may assist to provide additional information about the clients and easier access to the prospective clients (Blomqvist 2013). Consequently, firms have started to supply added value concluded from services in addition to products (Anderson & Narus 1998). The servitization literature proposes that the pressure for companies that have early on adopted servitization has come from different external demands like businesses of low-income countries (Baines and Lightfoot 2013), national economy transformations, and macro-economic industry relocations (Baines, Lightfoot, Benedettini, et al. 2009).

In the future, companies aiming to success might benefit from obtaining competitive advantage through development and creation of services, as it often leads to gaining new customers and keeping the existing customers. Therefore, in different industries and companies the basic division to either providing goods or services and even assuming they can be provided separately will not exist, as servitization will have a substantial influence on how business is done and how managers think and work. The separation between service providers and traditional manufacturers seems to be fading and by doing so changing the connexions and dynamics of competition in business environments. (Vandermerwe & Rada, 1988.) Providing services enables differentiation, tools for client loyalty development, entry barriers to the industry, and improved customer satisfaction (Avadikyan, Lhuillery, & Negassi, 2016; Bustinza, Bigdeli, Baines, & Elliot, 2015). Hence, there is a possibility to create sustainable competitive advantage through servitization as it liberates companies from competing barely on costs (Porter and Ketels 2003) and creates higher profits in most cases as the production requires less investments (Avadikyan et al., 2016).

Nonetheless, the distribution of superior services has required substantial modifications in the organisational processes, structure and culture, as well as the technologies used. (Baines & Shi, 2015.) The findings of Bustinza et al. (2015) indicate that companies are dynamically engaged on pursuing the continuum of servitization as they search to produce superior services through performance-based agreements and adding value to combine them with the products. As value creation and competitive advantage are the main objectives of most businesses, the servitization and its aspects, such as diverse strategic drive and organizational complexity, will be more in the hands of top management. As a result, the traditional management methods would need adjusting. This movement occurs globally in nearly all industries as both service companies and manufacturers have shifted to services due to globalization, technology, deregulation, and competitive pressure. (Vandermerwe & Rada, 1988.)

The term servitization was first used by Vandermerwe and Rada in 1988 and has been more common since publications by Baines, Lightfoot, Benedettini and Kay (2009) and Baines et al. (2007) (Rabetino et al., 2018). A competitive strategy led by services is currently a growing interest for both public and private sectors, on top of academia. Brax and Visintin (2017) state that servitization is a change process, where the product manufacturer intentionally or emergently adds elements of services in the business model. There is a variety of theoretical perceptions examining the inter-organizational relations in the traditional product context, as well as in product-service context (Palmatier et al., 2007; Mena et al., 2013; Karatzas et al., 2016; Eloranta and Turunen, 2015). The perceptions mainly used are resource-based view of the firm, relational view, network positioning, social exchange theory, transaction cost economics, and some more. For this research, the theoretical lenses of change and macro-micro factors are adopted from institutional theory.

Currently product companies ought to advance both products and services, on top of advancing technological foundation, to attain further viable value proposition, to become further effectual and operational, and to satisfy client needs. Substantial emergent technologies have been researched for factors to surge the profits of technology and to initiate the method to technical innovations. Servitization has lately concluded systems called product- service systems (PSSs), defining the combined development, actualization, and delivery of product-service mixes as a resolution to clients. Therefore, highlighting the importance to reflect equally the features of services and technology primary in the expansion

procedure. (Wiesner, Marilungo, & Thoben, 2017.) According to Breemersch, Damijan, & Konings (2019) also the labour market polarization in advanced countries especially with technology is resulting from reallocating workforce from industries with manufacturing toward industries of services. The potential factors that may have caused the affect have been globalization, offshoring, and technological change. (Breemersch et al., 2019.) All in all, the technological change and digitalization seem to be the main drives of servitization, especially digital servitization.

The benefits from servitization come from service dominant logic where is it seen that added service straight improve the worth of the material product (Vargo and Lusch, 2004). As the services are produced in collaboration with the client, they include clients as operating assets to co-create value, which is commonly exclusive and hard to replicate (Oliva and Kallenberg, 2003; Vargo and Lusch, 2004; Fang et al., 2008; Gebauer et al., 2011). Furthermore, services are acknowledged as a stable origin for profits and turnover margins, which in several fields further surpass the market profits of material products (Wise and Baumgartner, 1999; Gebauer et al., 2005; Raddats and Easingwood, 2010). Lastly, marketing academics declare that expanding goods with service sections upsurges satisfaction of clients on top of reinforcing client relations, thus, augmenting client recall and loyalty (Brax, 2005; Gebauer et al., 2006; Johnstone et al., 2009). Considering the aforementioned factors, the change process to servitization can be rather complex and it has various both micro and macro level factors that enable and drive the change but also factors that might hinder or disable the servitization.

1.2. Research gap

The servitization process and organizational change have both been studied and various outstanding literature reviews on both theories have been conducted. When it comes to the research conducted of servitization process, the significance of creation and implementation of strategy is emphasised, as well as, the outstanding part of the business models, on top of innovation and technology (Bigdeli et al., 2017). However, there is absence of seeing change models as the means to strengthen the outcome of strategy implementation on a consistent base that their ultimate aim is to upsurge performance. Additionally, there seems to be significant absence of studies analysing servitization and change process from beginning to

end, which indicates further investigation to observe organization before and after servitization process and implementation. Majority of the current researches are focused on design, distribution and acquisition practises for servitization, innovation and business models, new service creation, decision procedures or scenario simulations. (Bigdeli et al., 2017.) Accordingly, Avadikyan et al. (2016) state the current normative literature in the field focuses on products, processes, services, and the company as a combined structure.

In order to develop new offerings and services the business models would need to be improved and organizational change seems necessary. However, the processes behind the change are still not fully researched or comprehended. (Andrews, Dmitrijeva, Bigdeli, & Baines, 2018.) Even though, the change required from manufacturers for advanced services is challenging both for practitioners and for academics, merely limited important contributions focus on the subject (Baines et al., 2016). Also, Martinez et al. (2010) claim that while important contributions and theoretical frameworks exist in organizational change, there are still no figures clarifying the change required for servitization. Therefore, overall study of the theme appears to be disintegrated and incoherent, on top of missing a transparent and comprehensive agenda of the study. As a result, unavoidably barriers for the servitization transformation and implementation might be created due to the lack of knowledge. (Baines et al., 2016.) Thus, there is necessity to research the transformation of organization for servitization to gain a comprehensive framework. It is especially significant as servitization requires equal reflection of organizational change and business models. (Bigdeli, Baines, Bustinza, & Guang Shi, 2017.) Despite, very limited researches have studied the process of organizational change in the development of different servitization business models (Bustinza, Gomes, Vendrell, & Shlomo, 2018).

Even though, servitization research started with the focus of technology but due to the shift to strategic management, the technological concentration has slowly decreased, even vanished (Díaz-Garrido et al., 2018). Similarly, Andrews et al. (2018) researched that currently technology is not often stated to enable or to inhibit the change in organization. Conversely, the digital technologies and their value is commonly presumed in enabling the establishment of services. Therefore, understanding and managing the key technologies to deliver value is important, especially in the beginning of the organizational change process. (Andrews et al., 2018.) It seems that various companies have investigated the role that services have in performance but have not been reflection technology's potential as the

analytical operator that could affect the performance of servitization. Nonetheless, technology could increase the chances of offering even potential new processes on top of the prospective new products. (Avadikyan et al., 2016.) Supportingly, Díaz-Garrido et al., (2018) state that additional improvement of themes related to IT and factors regarding to sustainability and their relation is required as IT might be seen as the servitization enabler.

Additionally, the previous researches that have included technology have mainly been concentrating on technological elements. Whereas, the digital servitization study aims highlighting the interaction among business models and technologies. (Kohtamäki, Parida, Oghazi, Gebauer, & Baines, 2019.) Moreover, the digital part and digital servitization has not been studied profoundly in the context of change required for servitization. Technology and digitalization appear to empower novel methods of service delivery and client communication whilst shaping the foundation for numerous other matters (Kunz & Hogreve, 2011), thus, should therefore be investigated further.

According to Bigdeli et al. (2017) studying servitization process with theoretical framework outlook would be beneficial. Especially if the research would consider combining and comparing the macro research, the change processes of manufacturers, and already existing theoretical framework. This would help to reveal various sides of servitization, even some might be already discovered in previous contributions, there would further factors not yet discovered. Thus, this kind of research would not merely conclude to recognising exact research prospects but additionally allow refining the theoretical framework and add to the research of change management and eventually distribute comprehensive guideline to manufactures boarding the process of servitization process. (Bigdeli et al., 2017.) Furthermore, the outcome of research conducted by Bigdeli et al. (2017) imply that two macro opportunities to further study servitization exist. These are more profound mixture of general theory and servitization discussion and studying servitization in practice with the theoretical framework's lens. Beuren et al. (2013) also specified that product service systems' target is sustainability concluded from adjusting economic, social, political, and environmental pieces. Contradictory, only narrow number of researches study these macro dimensions and factors of servitization.

Crowley, Burton and Zolkiewski (2018) also state that there is a requirement to better comprehend the part of indented servitization in the change of the business model towards

servitization. Therefore, combining these theories by viewing servitization through the micro-macro factors affecting and combined with the change is relatively new ideology that has not been comprehensively studied. As companies and the evolution of businesses can clearly be seen to go more towards servitization all the time, it would seem rather interesting to be able to understand how the change process and its factors are conducted and affect the companies. Nonetheless, current literature barely covers the specific impact of change on servitization and even less in the contexts of digital servitization. Supporting, Parida and Wincent (2019) state that changes concluded from servitization and digitalization are barely reviewed in the current academic research. Even though, these changes grasp important outcomes of the ways organizations collaborate and how they develop capabilities and business models. Thus, new working manners and new methods to organize are essential. (Parida & Wincent, 2019.)

As a conclusion, the existing literature has not yet concentrated on the servitization processes emphasised above. This review focuses on this gap by combining the servitization information base from organizational change viewpoint and its affecting macro and micro factors with specifically focusing on digital servitization and classifying the established and unestablished matters to oversee future studies. Thus, previously servitization has been studied more from strategy-as-practice point of view where the focus has been more on the micro-level, on the behaviour and detailed factors within the company. Institutional and organizational theories on the contrary, have been focusing more on the macro-level seeing the causes for change in larger context. On the other hand, combining these levels and finding the links between them has not been studied comprehensively.

The current studies conducted on the field are largely founded on theoretical analysis or qualitative research on different factors of servitization. Whereas, theoretical consent combining change literature with the servitization research is limited. As indicated, combining the theories of servitization and organizational change especially from the viewpoint of macro-micro factors has not been widely studied yet. Therefore, comparing and analysing the existing theories it seems that there is a potential research gap to be filled for a literature review on this outlook, even more for being able to combine the theories with empirical data and analysis. Accordingly, the research is focused on the micro and macro factors of digital servitization change process and how to facilitate the change.

1.3. Research problem and theoretical contribution

Even though manufactures are influenced by researches conducted, they consistently request assistance regarding change implementation and the academics reply. Thus, it is crucial to guarantee research that equally defines how change arises and suggest in what way change should be approached. The particular divisions are intertwined and appreciative, but researchers stress expressive input and data, while practitioners are searching recommendations to defeat companies' difficulties. (Baines et al., 2016.) Therefore, this review aims to both create a theoretical contribution, as well as, provide implications from the theory that could be beneficial both for researchers and for companies.

As the mixture of servitization from change viewpoint have not been combined much before, this research specialized with the view on macro and micro factors of change appears to be essential. To conduct research concentrated on this topic, the below research questions were created, and this research aims to provide answers for those questions.

The research questions for the study:

- What are the micro and macro factors of change in digital servitization?
- How could companies facilitate change in digital servitization?

This research contributes vastly to the digital servitization, servitization and organizational change topics, as currently, this research seems to be one of the view systematic reviews conducted on the topic. The research provides insights and aids for research community but also valuable information for practitioners by providing profound outlook on the micro and macro factors enabling and hindering digital servitization change process, on top of listing clear ways to facilitate the change process. The results indicate that the extensive investments required for digital servitization oblige for substantial growth of value creation and appropriation to create the desired revenues as the implementation of digitalization obliges to invest in additional capabilities and resources. Additionally, it is important especially for companies to consider different micro and macro level factors that need to be acknowledged and taken into consideration as they may all affect the servitization change process in

different ways. To facilitate the digital servitization change process, attention needs to be paid to several factors concluded in this research. Furthermore, as a value to researches, the study points out variety of future research topics on the fields of servitization, digitalization and change. These research notions and other findings of this study have potential to provide beneficial insights both for the companies in the path of servitization and for the research community.

1.4. Thesis structure

After this initial introduction chapter, the study explains further the methodology of the systematic review conducted. Next, the terms used in this study and theory of change in servitization are further introduced. This is followed by chapter of facilitating change in digital servitization, which also further introduces and analyzes the micro and macro factors enabling and hindering the change. After that diverse future research ideas for different sections of the field are presented. Lastly, the results of the research are concluded and discussed in the final chapter with elaboration of the limitations of this study.

2. METHODOLOGY

2.1. Research strategy and method

The method used and correspondingly directed analyse increases the reliability of the research. Therefore, selecting the right method for the given research is crucial. Additionally, the research can be exposed to the author's own perceptions as the author determines the applicable aspects and boundaries, on top of choosing the method for the research. Consequently, these factors are important to keep in mind when planning and conducting researches. In most cases, the research results might not be the same with a different author. However, for the reliability and transparency of the research it is important to conduct it so that it could be duplicated with the same manner and that same results could be reached with different researcher. Also Bigdeli et al., (2017) state in their research that it can be challenging to conduct and interpret a reliable theoretical framework.

In order to avoid problems stated above, this research is conducted by using the recognised standards for the systematic reviews. The main idea of systematic review is to create literature research minimizing the bias from the process by directing the choices, actions, and conclusions build transparently, scientifically, and in a way that can be replicated. Systematic review aims to oversee the variety of information for precise theoretical analysis so that the conductor of the study is able to map and evaluate the current academic material and identify questions for the research to acquire the present information further. The process includes outlining search concepts and words, recognising the most important journals, and deciding standards for article importance. (Tranfield et al., 2003.)

2.2. Literature search

The limitation of the scope of the research can be challenging and with this research the main challenge was defining the key words for servitization. Within the field of servitization different researchers tend to use diverse terms to define the process of servitization and the border of the terms can even nowadays be unclear (Baines et al., 2009; Hou & Neely, 2013).

In this research the used search terms were decided by reviewing previous researches on the field and combining these key words. The search words applied to research systematically were: "service infusion" OR "servitization" OR "servitisation" OR "service transition" OR "solution business" OR "Industrial service" AND ALL "service infusion" OR "servitization" OR "servitisation". The search was done using titles, keywords, and abstracts of articles. The abstracts were additionally entered taking into account that they include most important theories of the articles. Additionally, the search parameters were set to search only for articles or reviews written in English. The time-period of the publications was not limited in the search and also the articles in press were included.

The primary search done in Scopus resulted in 95 articles. The list of articles was exported to Excel to facilitate the modification of the list. The process to further evaluate the articles continued by analyzing the articles in two phases. In the first phase the titles, keywords, abstracts and contents of all the articles were estimated more closely and articles with clearly irrelevant topics or that could not be accessed were deleted from the list. In the second phase, the articles were read and analyzed further to ensure the relevance of the articles.

In total, 12 articles of the original search were rejected based on a more detailed analysis, as the papers excluded lacked sharp input to the research or used the terms to describe alternative topic or could not be accessed any longer. Most of the articles rejected were focused on computing and directly to the software, thus, not fitting in the scope of this research. This concluded in 83 articles on servitization and change to be studied further. These papers were read and studied carefully to comprehend their place within the theoretical framework and its different subcategories. From there it was possible to contribute to the literature review and analysis from the cautiously studied articles provided by the systematic method.

This study is a formal demonstration of the research results at its original availability for equally academics and practitioners of servitization. The following analysis of the article review demonstrates the outcomes of thematical and descriptive examination and creates a theoretical framework representing the key theories and conclusions of the research.

3. CHANGE IN SERVICITIZATION

3.1. Definitions and dimension

Key Concepts:

- **Servitization:** Servitization can be seen as a method to create income streams from services to manufacturers (Johnstone et al., 2009; Baines and Lightfoot, 2013; Smith et al., 2014). Thus, servitization can be defined as concentrate efforts trying to combine services to products to gain added value through the services. Additionally, definitions involve the improved connection with the customers and the evolving organizational structure that comes from and within the change. In most definitions the importance of services is emphasized, as the business logic of companies needs to focus intensively on services. (Blomqvist 2013.) Companies can deliver several practises of services, varying from customer support to product support (Mathieu, 2001; Eggert et al., 2014). The services offered can be generally classified to base services; like products and additional parts, intermediate services; like training, maintaining, repairing and helpdesk, and advanced services; like contracts for supporting customers and result agreements (Baines and Lightfoot, 2013). In conclusion, servitization characterises business model innovation that changes income design, value propositions, and competences concentrating on creating value with clients instead of selling merely products (Storbacka 2011; Smith et al., 2014; Raja et al.,2018). It is mutually produced by alterations in operational environment and effects changing in what manner manufacturers function, thus, generating an obligation to remodel competences (Pawar et al., 2009; Benedettini et al., 2015).
- **Organizational change:** Organizational change is a process where organization changes the ways of working or intends to e.g. develop and handle new markets and occurrences. At times the change is required to maintain competitive in the industry. (Cambridge Dictionary, 2020.) Organizational change signifies a transformation in structure, situation or quality through time stimulated by arrangement within company's primary composition and circumstantial qualities

(Van De Ven and Poole, 1995; Rajagopalan and Spreitzer, 1997). Organizational change is a transaction of frequently rehabilitating the structure of organization and its abilities to attend advancing customer requirements (Baines et al., 2016). In manufacturing servitization can be seen as a change process in which a manufacturer purposely or in arising manner includes aspects of services to the business model (Brax & Visintin, 2017).

- **Macro- and microenvironment:** Commonly macro is in the larger scale, dealing with larger units or populations, whereas micro is dealing with individuals or small units. Thus, micro-environment is commented with limited interactions and features in and close to the organization. (Jeffrey, 1987.) Different practices, such as strategy-as-practice focuses on micro-level activities; the processes and practices illustrating strategy and strategizing, instead of seeing strategy merely just as a strategic plan and providing a different kind of angle for the company and process analysis (Whittington, 1996). Macro-environment on the other hand is about the factors in larger social scale including political, economic, social, technological, environmental and legal aspects (Jeffrey, 1987).

Servitization implies the modification of a business-model and organizational change that occurs shifting to sell combination of goods matched with services instead of selling only goods. This shift produces competitive advantage as its outcome. Throughout the processes of servitization, companies develop through different steps in order to understand services as the originator of customer satisfaction as they give the chance to distinguish the goods. (Bustinza, Bigdeli, Baines, & Elliot, 2015.) Thus, the organizational change process where new revenues are gained from services combined with product is called servitization (Vandermerwe and Rada 1988).

Additionally, servitization is defined as strategic business transformation, as the transform happens from traditional barely good focused model to a combined model that is frequently stated as the product–service system (PSS) (Baines et al., 2009). The challenges of this change can be created from different factors, one of which can be the lack of knowledge of innovations in the service field (Alghisi and Saccani, 2015; Ayala et al., 2017). The relations

between original product company, service suppliers, and customers are named by some studies as the service triad (Wynstra et al., 2015).

Commonly, the literature on servitization proposes three factors driving the adaptation of servitization strategy for manufactures; finance, strategy with competitive advantage, and marketing (Oliva & Kallenberg, 2003; Mathieu, 2001; Gebauer & Fleisch, 2007). Baines et al. (2010) on the other hand, separated the services offered in two types, first being the protective services that are offered by most manufacturers and normally contain helpdesk and training. The second type includes the spares and proactive services, which are offered by only around 20 percent of manufactures and include monitoring, systems integration, and maintenance. The separation according to Baines et al. (2010) can indicate different market value that can be obtained from services offered as the ones in demand are probable commoditized, and therefore, having limited influence on captivating new businesses. (Baines et al., 2010.)

The term servitization can be complex as it can be connected with the change in the company's location in the industry, offering category and scope changes, changing focus from products to services, and the changes needed in the organizational capabilities, relations and configurations. The common factor of different views is however the change from traditional manufacturer/product founded model to the amplified emphasis of services both in operations and in strategy. (Brax and Visintin, 2017.)

3.1.1. Servitization and change

Baines and Lightfoot (2013) state that services offered with goods have three different categories. The first of these service categories is the basic services, such as delivering under agreement or warranty replacing parts to sold goods. The second category is the intermediate services, including training, maintenance, support, repair, and overhaul. The last category is the advanced services, which can be different sets of services, like all-inclusive customer support contracts and outcome-based agreements. (Baines and Lightfoot, 2013.) The shift to services creates a need for change in each segment of business model. Thus, companies ought to be unconventional from the traditional way and are required to make services and their development a general strategic primacy fastened with top executives. If there is no executive

commitment, the necessity of assets to create novel capabilities might not be acknowledged in divisions that are not connected with clients and functions are not easy to align. However, there are numerous potential business models that can each be prosperous for servitization. (Storbacka, Windahl, Nenonen, & Salonen, 2013.)

Vandermerwe and Rada (1988) state that servitization has been changing the way companies operate in three different steps. The first step being originally producing either goods or services, followed by the step of combining these two. The third step additionally includes support system, knowledge and self-service around the good and service combination. (Vandermerwe & Rada, 1988.) Blomqvist (2013) presented in his study that the phases of servitization contain the transformation from products to add-on services, to solution providing, and lastly to being performance supplier. In most cases, the firms have faced variable actions in the service development and are not on identical phases. (Blomqvist, 2013.) A study by Brax and Visintin (2017) acknowledged three different methods characterizing servitization; step-by-step change, stepwise progress designs, and end-state. In their study different change steps of servitization were analyzed through four different scopes; life cycle of product service arrangement's fundamental coverage; which actors are accountable for the step, model of payment, and ownership. (Brax and Visintin, 2017.)

In the model created by Avadikyan, Lhuillery and Negassi (2016) the main differencing factor in servitization is product innovation instead of the organizational change and technological innovation compound. Additionally, their research states that the affect in servitization performance varies subject to the quantity of leading companies or to the repartition of companies among different industries. (Avadikyan, Lhuillery, & Negassi, 2016.) Beltagui (2018) on the other hand, states that the business model has to be designed and the design needs to consider the company's capabilities, as they and the business model need to be developed together for the change. Thus, from strategic viewpoint, the business model and change process of servitization, switching from products to services, are profound (Cusumano et al., 2015).

The servitization capabilities cannot be effortlessly copied as they are specialist knowledge that is complicated for others to acquire (Løwendahl, 2005; Beltagui, 2018). However, for profitable service delivery, the present capabilities should be taken advantage of and novel capabilities searched (March, 1991). Thus, it is essential that the possible opportunities are

seen and the capabilities to take action on them are recognized (Leonard-Barton, 1992; Oliva and Kallenberg, 2003). Kreye, Roehrich and Lewis (2015) specify that creating and retaining relational capabilities may be seen as fundamental distinctive aspect for manufacturers' relations.

Servitization does not merely regard big firms, instead it additionally includes small and medium enterprises (SMEs) (Confente, Buratti, & Russo, 2015). Especially with globalization various SMEs have to deliver services to satisfy customer demands and keep their position with the competition (Dangayach and Deshmukh, 2005; Prajogo and McDermott, 2014). In the change process the SMEs have a significant benefit as they are often agile, innovative and capable of developing new products and services promptly even with fewer resources (Prajogo and McDermott, 2014; Wong and Aspinwall, 2004). However, to offer the added value from servitization smaller firms have to display a great amount of entrepreneurial competence and knowledge (Confente et al., 2015).

Industry settings and environment are frequently altering and consequently attaining competitive advantage might demand companies to endlessly amend their offerings by decreasing some services, announcing new services, or re-concentrating on the product-based offerings (Forkmann, Ramos, Henneberg, & Naudé, 2017). Therefore, manufactures must have the ability to increase but additionally to decrease the service mix composition, for example they might need to do service de-fusion instead on infusing new services (Ivens, Henneberg, & Forkmann, 2014). Study by Forkmann, Ramos, et al. (2017) also introduces and emphasizes the concepts of service infusion and de-fusion that influence key changes in each stage of business model and are motivated by numerous experiences, transformations, and interchange tools and capabilities. The possibilities to adjust services permits companies to respond altering environments or to grasp market prospects from shifting their business models' service factors (Anderson & Narus, 1995; Kindström, 2010; Kowalkowski et al., 2012).

3.1.2. Digital servitization

Digital servitization is an evolving view dephasing the interplay of the vital concepts of technology firms and manufacturers, servitization and digitalization. The term digital

servitization is described being a change progression from merely goods and added services in the direction of systems of smart product-services. (Kohtamäki, Parida, Patel, & Gebauer, 2020.) These smart combined product-service systems facilitate value generation and appropriation concluded from governing, automatizing, observing, and optimizing. In order to obtain value from the digital servitization, companies ought to exploit three digital offering sections, like software, services and products of digital offerings, and those ought to function together. (Kohtamäki et al., 2019.)

Nowadays, technology and digitalization are in all places, also in services technology is the principal service innovation foundation. As a demonstration, for increased efficiency robots are in use for serving at restaurants, cleaning and driving cars. (Huang & Rust, 2017.) Additionally, CRM technologies assist with advances in satisfaction of clients and quality of services, for example with utilizing big data analytics in call centers (D'Emidio et al. 2015). The quick improvements of technology have illustrated the modern-day world, thus, it is progressively crucial to integrate technological change to the consideration of most beneficial manner of service strategy (Huang & Rust, 2017). The appearance of a novel technology directed service framework that is universal, always available, and connected is generating profound changes. These changes occur in client experience and value creation, delivery, and organization of services, on top of networks and ecosystems. (Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015.)

Technology interrupts conventional business models even if they have lasted for hundreds of years. Service transition implementation also obliges for technology. Thus, re-investigating the tools used to realize if all of the accessible technological advances especially the network and communication technologies essential for servitization are required. The developments in communication technology assist manufacturers to complement services to their offerings for new value creation. More and more commonly customers will approach all as a service from the cloud with strategic suggestions especially for the product orientated ITC firms. (Bridge, 2014.) The emerging digital change of information technology creates a need to develop even further significant enabler to deliver the information required for administrating risks and expenses, on top guaranteeing effectual customization procedures (Visnjic, Jovanovic, Neely, & Engwall, 2017).

Dispersion of universal information and communication technologies has heavily declined the fees of added technologies, allowing usage of data censoring, storing, and managing. Consequently, permitting service deposition to facilitate delivery through novel smart interaction and action competences. Furthermore, systems engineering is developing from central progress practice for separate systems and mechanisms to arrangements of circulated hardware and software, and business procedures aimed at mutual resolution. The measure and density of the matters aimed with systems engineering are continually increasing through the emerging product service systems. (Wiesner et al., 2017.)

Furthermore, the interchange of servitization and digitalization is beneficial and important at high level of servitization especially, advancing firm's economic performance. Thus, there is a requirement for efficient interplay called the digital servitization. Merely digitalization might not be sufficient to create helpful economic outcomes for manufacturers. Hence, firms are required to have advanced services guaranteeing value seizing of digitalization for the beneficial performance outcomes. The value of assets invested in digitalization ought to be obtained concluding from the business model, like business model for digital servitization. However, scarce amount of research has been conducted of this relation amid servitization and digitalization for manufacturers. (Kohtamäki, Parida, et al., 2020.)

Contrary to usual innovation of products, researchers have managed to include new technological processes such as information and communication technologies (ICTs) as the factors facilitating servitization (Barras, 1986; Kellogg & Nie, 1995; Lightfoot, Baines & Smart, 2011; Windahl, Andersson, Berggren & Nehler, 2004). Different information technologies and systems assist companies to recognize and adjust to variety of customers and their needs, and to change and exploit the external information (Froehle, 2006; Nonaka & Teece, 2001; Joshi, Chi, Datta & Han, 2010). As a result, the technologies and systems are assisting companies to explore and select new business prospects and offer distinguished services to the products. Additionally, ICTs decrease the cost of delivering services and assist to change prospective services to profitable by decreasing production, in-house information, management, and transaction costs. Furthermore, ICTs can lead directly to totally new services or they can be linked to complementary technologies that create or deliver innovative services. The ICTs have also assisted in creating stronger links between companies and their clients as the processes, such as delivery that can be tracked online. Thus, switching costs

seem to increase and potential product and service innovations may be found. (Avadikyan et al., 2016.)

Of course, other technologies besides ICTs are used in manufacturing companies to enable improved effectiveness and success of product design, production, and testing and potentially leading to added flexibility in the product design, merging the production proficiency and product and service differentiation (Hofmann & Orr, 2005; Lei, Hitt & Goldhar, 1996). Technology has also enabled the customization of quality, functionalities, and consistency. Furthermore, it has enabled the customers to interact efficiently on desired qualities, deliveries, and productions. Thus, generating more favorable atmosphere for manufacturers of products and product related services. Applying new technologies can assist with production and back office, with integration and adjustment of organizational values for services, and to find new services and opportunities. (Avadikyan et al., 2016.) Wiesner et al. (2017) also state that technology brings out novel challenges. The key topics recognised are further difficulties, many dispersed stakeholders, and the contribution of various disciplines through their individual formulas and features, like ICT, products, and services. Numerous diverse stakeholders for the total system might imperfect information concerning the requirements and limitations of the separate sections that can be changed with the usage of universal model and guidelines in the system. (Wiesner et al., 2017.)

Corradi et al. (2019) conducted a study regarding to ice cream machines and production, where applying digital smart appliances and technology concluded in much upgraded effectiveness of after sales support. Consequently, allowing the companies to try innovative business models involving servitization. (Corradi et al., 2019.) Furthermore, embracing the innovations of digital technology gives companies several benefits as they do not have physical limits for internationalization, and they can simultaneously reach various clients. Additionally, digitalization reduces waiting times in general and for prototyping as well as decreasing working hours. Technology also enables to develop innovative products and services with improved consideration to features and accuracy of product innovation and manufacturing. (Bonfanti, Del Giudice, & Papa, 2018.) Thus, digital servitization permits firms to create exact entry barriers and generate isolating devices for upholding competitive advantage. Quick combination of technologies through products has presented novel instruments to distribute services supplementing the products. Digitalization has verified to be considerable beyond just gathering and transmission of information across the

organization as the outcomes are further than digital platforms and utilisation exact profits that can be afforded. (Sánchez-Montesinos et al., 2018.)

Digital servitization contains various business models enabled by technology for generating competitive advantage from offering digital services based on customer knowledge throughout the total product life cycle (Bustinza et al., 2018). The business model reconfiguration obliges for organizational determination to constantly adapt to the environmental conditions of the market (Bustinza et al., 2018). As a result, the digital technologies facilitate the companies to combine digital services and products in digitally integrated solutions founded on improved understanding of the needs of the customers (Windahl, Andersson, Berggren, & Nehler, 2004; Martinez, Bastl, Kingston, & Evans, 2010). These business models focused on customers have an effect on the entire value chain and are encouraging to continuous organizational change process (Bustinza, Parry, & Vendrell-Herrero, 2013; Vendrell-Herrero, Parry, Bustinza, & O'Regan, 2014). Therefore, digital servitization commands for an organizational structure that is able to continuously reconfigure the strategic capabilities of the company in order to respond to the constantly changing customer needs (Baines et al., 2017). However, most companies on the way of servitization have trouble delivering bundles of technology enabled digital services with customized products (Martinez et al., 2010). Supportingly, studying digital servitization of newspaper industry, Cestino and Berndt (2017) highlighted the importance of comprehending the offerings as the products are delivery instruments for the service arrangement concentrating exact customer needs.

Digital business strategy facilitates companies to profit from profound data allocation and accomplishment of novel value propositions to clients in the digital setting (Srivastava & Shainesh, 2015). Study by Sánchez-Montesinos et al. (2018) indicates that firm can obtain the aforementioned aim by trusting on different digital solutions permitting to reply rapidly and efficiently to demands from increasing amount of digitally invested associates (Abrell et al., 2016). The digital competences enable service planning, developing, and reforming that facilitate delivery of digitally qualified services explicitly planned to encounter needs of associates (Opazo-Basaez et al., 2017; Sánchez-Montesinos et al., 2018).

To overcome the challenges of choosing correct strategy Huang and Rust (2017) suggested based on their research service strategy positioning map where technology is in the main part.

The map includes motivations of strategy concluded both from the transactional relational way and standardized customized way of strategies. The first two of four technologically focused services strategies are: “the McService strategy”; for automatized technology to reach efficiency through standardization and “the Relational Service strategy” for CRM technologies and databases to refine client relations for increasing customer life value. The second two service strategies are: “the Customized Transaction strategy” for analyzing big data to reach customization for fee proficient data-based personalization and “the Adaptive Personalization strategy” for emotional technologies and artificial intelligence to exploit customer life value through flexible personalization. Companies are able to discover the best points for them from the map and choose the strategical courses based on that. The four mentioned strategies replicate the development of market investigation of services and adopt from previous ways of seeing servitization to present way concerning flexible personalization. Through the ongoing development of technology, growing proportion of services might be relational and personalized with technology to improvably encounter specific client needs. As a conclusion, the main drivers of service strategies should be in co-creation of personalization and client relations reached though advances in technology. (Huang & Rust, 2017.)

For the implementation of digital competences it has been vital to comprehend and foresee demands, facilitating unified transmission of consistent data, safeguarding improved service delivery and allocation, and confronting the large scope and substance of product groups (Sánchez-Montesinos et al., 2018). In case study concluded by Sánchez-Montesinos et al. (2018) digitalization presented agile and novel communication tool amid the company and its retail associates, enabling and fastening the interaction of applicable business data. Furthermore, the implementation of digital competences allowed the company to cooperate frequently with trade associates in actual time, obtaining precise data appropriate for forecasting demand and delivering on time digitally facilitated service delivery. Thus, augmenting supply of products and attaining superiority to encounter demands from clients (Abrell et al., 2016; Sia et al., 2016). Concluded from application of digitally facilitated services, companies can profit from associates with scope and scale economies, growing offering's value, and creating sustainable differentiation and benefits (Sánchez-Montesinos et al., 2018; Porter & Heppelmann, 2014; Amit & Zott, 2012).

The research results by Sklyar, Kowalkowski, Tronvoll and Sörhammar (2019) propose that consistent service procedures and increased centralization and managing are vital for digital servitization, besides added backup from broad IT assets. Central power for making decisions improved equally international competence and reaction to client needs. The necessary harmony of client boundaries and digital platforms through markets and divisions additionally stress deeper inner integration, on top, service focused mindset. Furthermore, digitalization allows companies to rearrange the business of services as services formerly needing local attendance and elevated grade of client communication, novel services are more software focused. The need for less material assets implies fewer necessity of local parts. (Sklyar et al., 2019.)

The change of digital services obliges companies to take further complete outlook of the services and their strategy. Conservative research and development actions may be administered from the centre for attaining global competence and adjustment, services necessitate amplified local reaction and keener client relations. For further progressive services, superior integration is required among product and service entities and local and central divisions. Throughout digitalization the organization out to have further active controlling part to guarantee quality of data and reliability of software for handling matters of cyber security issues, providing the necessary data discipline abilities, and assisting local entities. (Sklyar et al., 2019.) Consequently, even servitization is widely emergent and incremental procedure in various organizations, the digital change needs further focussed and synchronised exertion (Kowalkowski, Kindström, Brashear Alejandro, Brege, & Biggemann, 2012; Palo, Åkesson, & Löfberg, 2018; Sklyar et al., 2019). Generally, central organizational construction ought to familiarise mutually utilisation and examination of digital service abilities. Although central entities are required to guarantee the obtainability of digital assets and competences, exceeding centralization may hinder local adjustment and innovation of services. Beneficial centralization alters on combination of local and central integration facilitating improved asset distribution and local provision. (Sklyar et al., 2019.)

All in all, the IT systems that are easy to implement appear to create a straight impact on the economic performance in case the distribution fees are small. At advanced fee and quality stages, investments of IT ought to be reinforced by added organizational competences, concluding as further challenging and exclusive implementation of the investments. Nonetheless, it appears that servitization might assist organizations to deal with the paradox

of digitalization. Both the servitization and digitalization arise across multifaceted change procedures and synchronised development of the procedures obliges for insincere innovation capabilities. (Kohtamäki, Parida, et al., 2020.)

3.1.3. Change management

Jergovic, Vucelja, Inic and Petrovic (2011) state that all companies can be divided to those who change and to those who disappear. In industries defined by pioneering technology, changing preferences of clients, and influential rivalry, there is no doubt if companies are ought to change, but how, what, where and to which direction the change needs to be done (Meyer, 2007). Organizational structure and value chain position are among the various matters that companies have to address with the change required for developing service businesses (Bustinza et al., 2015). Inclined the significance of organizational change in servitization executives ought to plan in what way they will enable the process of change (Vendrell-Herrero et al., 2014; Barnett et al., 2013; Ahamed et al., 2013; Crowley et al., 2018).

Organizational change transpires to answer for occurrences of internal and external circumstances, which have demonstrated to affect the efficiency of the organization (Paton and McCalman, 2008). Whilst estimating change according to framework by Pettigrew's (1988) two features of the situation are ought to be reflected. These are the inner setting; the aspects in the organization that the change has to be progresses and the outer setting; the aspects that are outside of the company. (Pettigrew, 1988.) Lately in the strategic change literature the given aspects have been broadened to comprise internally the culture and structure of the organization, directions of strategies, management and power, political features, trust and board development phase, and externally the industry, technology, environment, economic and social situations, political status and regulations (Bigdeli et al., 2017).

The process of change consists of different models, techniques and pathways (Baines et al., 2016,) and is in the organization mix of activities required to achieve the change wanted (Armenakis and Bedeian, 1999). Pettigrew (1997) describes development as a progression of separate and cooperative occurrences, activities, and actions progressing

though time in framework. Van De Ven (1992) and Van De Ven and Sun (2011) enlarged this by observing progression in three methods: as a coherence or pattern describing an original association amid dependent and independent adjustable, as a set of theories of separate and organizational activities (like systems for making decisions, as well as systems to create and implement strategy), and as a progression of occurrences defining in what way matters change throughout time. Technology as part of change enables information stream, permitting interdependencies in the process of change and reconsidering the line in between of the company and its environmental settings (Chesbrough, 2003).

Another factor of change is the content of transformation handling with the consequence or result of the progression (Baines et al., 2016). The literature of strategic management conventionally examines the content at the stage of business, operation, and/or company (Wit et al., 2010; Wheelen and Hunger, 2011). Aforementioned outlook has been lately enlarged to contain organizational networks. Four different stages can be observed for the outcome of change; network, corporative, business, and functional levels. (Baines et al., 2016).

In the framework of Pettigrew, the descriptive and prescriptive orientation is one of the factors of change (Pettigrew, 1988). The framework is regularly adapted to reflective researches of change, defining by what means occurrences happened (Stockdale and Standing, 2006). Baik et al. (2019) named the collection of synergistic and commonly supporting practices, which are critical to advancement of performance of a company, as high-performance work systems. These include practices of training, staffing, rewarding, incentive and appraisal systems. The high-performance work systems improve the internal environment by delivering the essential stability to internal procedures, structures, and interactions. Thus, endorsing the higher performance actions needed for servitization. (Baik et al., 2019.) As servitization needs amplified interaction with customers, it is even more significant for employees to comprehend the needs and expectations of customers (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004).

Laine, Paranko and Suomala (2012) studied usage of business game concept in enhancing servitization and found it to be suitable tactic for achieving and distributing awareness of clients. The business game concept can be particularly helpful for communicating usage of client data during the servitization. Nonetheless, the procedure of the concept is mainly restricted to business-to-business settings, where products are connected to production and

yearly reporting seizes vital segments of customer value. Active market investigation methods allow client participation in further adaptable way, hence demonstrating a continual check of reality for the method used. The business game with the studied company appeared to answer to the necessity of creating and sharing notions of clients' business and the wanted role in it. The aforementioned would assist firms to describe servitization's scope in specific situation and to enrich common knowledge about the servitization amongst the vital stakeholders. (Laine et al., 2012.)

In research conducted by Baines et al. (2010) nearly 70 percent of the respondents implied their service strategy being from top to down originated, however, only 25 percent of these believed that the strategy is a result of exhaustive analysis. The remaining 30 percent was divided to believe that the strategy origin was from bottom to up; initiations coming from lower levels of the organization or other origin such as that it has always been there, that it is natural addition to the business, or it is customer driven. Additionally, less than half of the respondents stated there to be any organized way of service design, even though most companies within the research declared that service offerings had been developed together with customers. (Baines et al., 2010.)

However, for companies to benefit from servitization they are required to configure a form to be associated suitably with strategy (Neu & Brown, 2005). Structure of organization is mainly resolute through two aspects; corresponding inner abilities alongside strategic commercial necessities and organisational legacy (Leong & Tan, 1993; Bartlett & Ghoshal, 2000). Solid local presence and sensitivity of market change and client favourites is particularly vital if dealing happens locally, since it is regularly the situation with services (Sklyar et al., 2019). Furthermore, companies servitizing often allow considerable authorization to make decisions to lower executives as they are closer to clients (Neu & Brown, 2005). Nevertheless, numerous companies consequently centralize processes to make decisions again and present a principal coordinating entity for the organizational change (Vendrell-Herrero, Gomes, Bustinza, & Mellahi, 2018; Davies, Brady, & Hobday, 2006; Sklyar et al., 2019). Thus, improved interactive and organisational embeddedness are pushed by amplified productivity demand of collaborating associates and the market. Concurrently, centrally run digitalization enables added engagement of associates, reinforcing inner integration. Environment features and company's managerial legacy and position in the environment attend to aid digital change. (Sklyar et al., 2019.)

3.1.4. Micro-macro factors of change

Various researches imply that several manufacturers feel positive exploitation of the possible extensive services particularly challenging (Gebauer et al., 2005). It is significant to realize that servitization and organizational change might contribute as benefits but also as risks. The expansion to services necessitate manufacturers to handle growing and various risks that affect the failure or success of the organizational change and the improvement, and the growth. (Cui, Su, Feng, & Hertz, 2019.)

Numerous researches have focused in adaptation of servitization on the empowering part of technology (Belvedere, Grando and Bielli, 2013; Durugbo, 2013). As an illustration, Geum et al. (2011) suggested modified framework for the product-service planning with inclusion and accordance of the involved technological edge. Specifically, to create and deliver customer value, manufacturers progressively implement distant observing technologies (Daim et al., 2010). Findings by Sheth and Sharma (2008) additionally suggested the part of technology's influence in the development of sales organization. Such as development in customer interaction with the usage of information and communication technology (ICT) and accuracy analytics have changed conventional sales to organizations focusing on customers with international account management divisions. (Sheth and Sharma, 2008.)

Furthermore, many studies have suggested servitization model also to be used with social and environmental matters (Gaiardelli et al., 2014). On the other hand, for influential financial viewpoint, Araujo and Spring (2006) stated that the result of servitization is defined by economic configurations, instead of barely technical conditions, like aspects of services and products. Thus, on top of the micro factors of the organization and its network also the macro factors and changes affect the servitization and which themes are concentrated on by the community. The macro contains aspects such as globalization, economic slump or growth, varying customer expectation, amplified transportation, world's manufacturing base changes, and technological innovations. Environmental factors, arrival of innovative processes and information, technologies of communication have all shifted the servitization types through time, and both researches and practitioners have been obligated to react correspondingly. (Díaz-Garrido et al., 2018.) Accompanying, Confente, Buratti and Russo (2015) state that the drives of servitization are strategic, financial and marketing factors. Contrarily, they also focused on the barriers of servitization and highlighted six different

factors possibly prohibiting or complicating the servitization process. These factors are society and environment, competitors, suppliers and partners, financial situation, customers, products and activities, and information and knowledge. (Confente, Buratti, & Russo, 2015.)

The study by Baines and Lightfoot (2013) discovered that operational services and their locations, information technologies, integration of the service distribution, human capital, performance evaluation, employee positioning, as well as, business models and customer relationships are all merged within integrative framework, which demonstrates the structure of operations in effectively distributed advanced services. The internal ecology that is required for servitization process is supported by HR practices for employees and their interrelationships. Therefore, even the external ecology is additionally crucial, the internal ecology with different HR practices is stated to be correspondingly essential to improve interaction of employees and their service-providing abilities. (Baik et al., 2019.) In the improvement of service delivery process the role of human capital is also emphasized by Rabetino, Kohtamäki, and Gebauer (2017). While the technology and tools to communicate within the ecosystem of external servitization are provided by further approaches such as the platform approach and the internet of things (Cenamora, Rönnerberg, & Parida, 2017; Rymaszewska, Helo, & Gunasekaran, 2017; Baik et al., 2019).

Further to the micro factors of the organization, Raja, Green and Leiringer (2010) state based on their study that business partnering and its implementation for change management has to be comprehended in context and cannot be deserted from further coexisting change plans. Likewise, in the study HRs efforts to locate as strategic associates was further nuanced instead of just associating with the strategic requirements of the organization. Additionally, there seems to be dominant trend to perceive the setting of HR operating as principally fixed ill-assistant to develop further strategical alignment and to considerably restrain the challenges encountered in practice. Additionally, challenges occur as strategic goals are constantly evolving and challenged throughout diverse business divisions. On top, the not centralized structure of business divisions individually trying to meet the needs of various markets seems to be leading to quickly scattered strategic intent. Thus, highlighting the importance of business partnering and governance in change management as big companies are not quite often motionless identical units operating in a sole institutional setting. (Raja et al., 2010.)

Baines et al. (2010) state that furthestmost service strategies are founded on the total sales of products with complimentary contracts for support and service. Therefore, commonly with service strategies manufacturer is accountable for risks previously expected by the customers. In the cases where manufacturers enlarged the acquaintance to risks, it is mitigated with technological and contractual methods such as official agreements for performance and asset performance observing remotely. The most used ways of measuring the success of services are the profit created by the services, the customer satisfaction and retention, and the sales. The service value is often verified to customers with monetary savings and improved product performance. Hence, manufacturers are largely involved in the service offering to create more revenue and to reinforce customer focus as they suppose that the customers are mostly interested about the services as a way to reduce risks, costs, and investments. (Baines et al., 2010.)

Baines and Shi (2015) divided the service strategies into defensive and offensive strategies. In the defensive strategy the focus is in cost savings, business efficiencies, and predictability, which improves financial, risk, and assets management from cost reductions and savings, fixed costs transferred to predictable variable costs, and improved asset security and reliability. Additionally, the defensive strategy increases safety, environmental factors and organizational change. Through responding to demand, rival lock-out, stable income streams, considering of legislation, and expanding product lifecycles increased commercial viability is gained with the defensive strategy. On the other hand, the offensive strategy provides business focus, competitiveness, and growth through improvements and investment to capital investments, core competencies, and adaptation of advanced technologies. Furthermore, growth is gained from product innovations, customer intimacy and business process innovations with customer base growth, and developed product design. (Baines and Shi, 2015.)

The benefits of service strategies for defensive strategy are cost and business efficiencies and predictableness are improved, and for offensive business focus, competitiveness and growth are improved. The defensive service strategy provides customers benefits such as refining management of finance, risks and assets with cost reductions and savings. This is gained from the customer side by shifting fixed cost into variable cost, enhanced asset security and reliability, and improvements in safety, organizational change and environmental issues. From the providers side commercial sustainability is enhanced with barriers for competitors,

customer demand reaction, expanding the product lifecycle, and stable revenue streams. On the other hand, the offensive strategy is pursuing to refine the investments and focus by concentrating on core competences, technology adaptation; access to associated skills, and increased capital investments from the customer side. From the providers perspective there is more growth throughout market adaptation with product and business process innovation, customer growth, better product design and gained new customers. (Baines and Shi, 2015.)

Similarly, the company has to shape strategic alliances as merely own product and services are not often sufficient for comprehensive offering solutions. Therefore, companies aiming for growth through services with a strategy comprising multi-compound offerings should be ready to create firm relations with other companies that may have rival products. The contrast of if rivalry products should be provided and endorsed, probably in disadvantage of products is possibly coming progressively contentious since clients look for novel service relations with certain suppliers. Thus, the strategy and its pros and cons should be assessed as it with service differentiation are the challenges many firms will encounter in upcoming years. Through improved comprehension of company's own choices, especially in the framework of clients' operational actions and products of other sellers, further careful valuation of the growth options may be concluded. (Raddats & Easingwood, 2010.)

3.2. Servitization as a change process

Many organizations have started the change between offering goods or services and delivering value across the usage of combined solutions with addition of services to present goods, or by offering the clients value and creating a sustainable lasting revenue. Especially due to the significance of the aforementioned reasons, industrial companies ought to consider servitization as a novel corporate level strategic option making improved results and competitive advantage achievable. (Díaz-Garrido et al., 2018.)

Brax (2005) state that usually stable change is seen as acting carefully, thus, it is seen as more secure and simple while big and rapid changes are seen as challenging and uncertain. However, there is a contradiction as in practice the developmental change from manufacturer to service provider can be riskier than the radical change. (Brax,2005.) Undoubtedly, the different internal and external factors of organization all have the potential to affect the

implementation of servitization in the organization (Baines et al., 2016). Digital servitization obliges for organizational structure that is capable of continuous reconfiguration of the firm's strategic capabilities to meet constantly changing customer needs (Bustinza et al., 2018).

According to Baines and Shi (2015) the manufactures that have implemented the servitization process and recognized the customer benefits wanted, also found additional benefits to reinforce their competitive advantage indicating that servitization affects positively on growth, resilience, and competences. However, trade-offs are unavoidable as some traditional revenue streams are sacrificed. The adaptation and delivery of advanced services has, however, come from going through substantial organizational change. Most prevailing changes were done within organizational culture and staff. (Baines & Shi, 2015.) Different bases of value defeat and gain, on top of trade-offs of drivers for value exist. Though lock-in value is essential for service contracts, it can cause value defeat as well and the complexity of different value drivers ought not to be undervalued. Equally value defeats emerge as a consequence of distribution insecurity and unexpected and new situations. Thus, client relations and trust are vital to find the most beneficial ways to proceed. (Visnjic et al., 2017.)

Oliva and Kallenberg (2003) discovered a repetitive design of activities that were taken in positive change continuity to include the following four phases. First, manufacturers combined the services related to products and regularly transferred services to new formed service division. Secondly, manufacturers enrolled the connected foundation of service market concluded from outlining and examining the market, generating a structure for marketing and distributing services and answering to local demand of services. After the manufacturers would be able enlarge to services founded on relations or they would be able to concentrate on services focused on operations. Finally, then at the last phase, shifting to the processes of end-users. (Oliva and Kallenberg, 2003.)

Through reflection of the sections from product and client focuses firms may consider which growing options and strategies are most suitable (Raddats & Easingwood, 2010). Raddats and Easingwood (2010) identified three growth choices in their study connected with four different strategies studying service growth options for B2B product orientated companies. First is the beginning status of many firms where services are used to upturn the product differentiation. Shifting to second strategy, which is one growth option, ought to produce amplified profits from services and a slight growth of risk since the investment essential are

mainly focused on having trained workers on suitable products and holding parts for reparation. The change to third strategy, which is second growth option, ought to produce better income than the first growth option and create an opportunity to convert to be further strategic supplier for client, nonetheless the risks are larger, as clients might look to allocate service delivery risk. Correspondingly, skilled service delivery obliges solid relations with clients and possible investments in novel instruments, procedures and staffs, eventually concluding in further service-oriented focus through the organization. Change to fourth strategy, third growth option, may possibly offer superior income of service than the first and second growth options and assist firm to develop to be main supplier for clients from providing multi-compound offerings like integration of systems technic consulting and product operations. Nonetheless, the aforementioned additionally includes largest risks as the organization may have adopted further consultancy focused tactic instead of sales, to comprehend and satisfy clients' business problems instead of searching chances to trade their products. (Raddats & Easingwood, 2010.)

3.3. Sections of servitization change process

Baines et al. (2016) replicated change model of Pettigrew (1988) to combine different points of the change process in servitization. These are; context, process and content of transformation, and descriptive and prescriptive orientation. Gebauer and Fleisch (2007) highlighted the organizational choice of servitization and studied that extensive interpretation of service market assists directors in understanding that services may create a key share of the value proposition for manufacturers. The relations between the operative actions of company's business divisions and transformation for servitization are the common topics of the researches with the business level (Ziaee Bigdeli et al., 2017). For example, Johnson and Mena (2008) studied the possibilities and challenges that management of activities in supply chain came across inside the companies aiming for servitization.

Brax (2005) highlights that the change from products to services requires co-operation and -production with clients, thus, it is crucial that each individual included comprehends the idea of the service. Service providing also necessitates efficient management of information and the transaction-based methods and practices are not sufficient. The service delivery cannot be organized as projects either as the customers need continuing support. Therefore,

functioning methods for management of information and integrative information procedures are fundamental for providing services. The service support process is multifaceted and requires quality for productivity, thus, the change and support have to be completed through the organization for providing successful services. (Brax, 2005.)

Studies show that services must be amended to diverse cultures as they need to be designed to support different practices and goals of the clients. Therefore, on top of the organizational factors it is important to comprehend the industry and operational condition as well as different business contexts. Since services are a continuing process, interaction with clients is required though the whole relation to support the essential co-production of services. Study by Brax (2015) indicated that even though technology is important, the customer rarely consider top quality technology as the utmost essential factor in their decisions but instead see the offerings as a whole where relation, support, and context are significant aspects. Therefore, in the change of servitization for a manufacturer, the services cannot be just added to the initial products overall offering. Instead, further fundamental means are required for searching the implied outlook of the circumstances where the organization functions. (Brax, 2005.)

Furthermore, substantial confirmation occurs focusing on the conjunction of advanced technologies and operative arrangements (Baines and Lightfoot, 2014). The results of the investigation in the functional level have concentrated on the exact functional features of the company, containing design, communication, sales and so on (Bigdeli et al., 2017). With this topic, Turunen and Toivonen (2011) studied the connection with management of customer relations and servitization claiming that even previous literature highlighted the positive results of a distinct service division, their case study implies that only the distinct unit is not assurance for succession with service business.

Supporting, Gremyr, Valtakoski and Witell (2019) studied service modularization and propose that it occurs in several phases and each stage has substitute development procedures. Additionally, modification development of services alters the features to the insertion of the service element in mix of services. Companies looking to profit from service combination can come across with difficulties to strategically merge established services and services developing from client cooperation. The manner of starting and developing a service unit has diverse consequences on the module of service features. Thus, validation practices

for advancing services to service modules are required. Platforms of service allow advantaging unities of services; joining the profits of service uniformity and customization of service delivery. The platform for services can possibly produce strategic profits, like proficiency of delivering services and may function as an innovation facilitator. In conclusion, effectiveness of service uniformity and agility of rearrangements, are not comprehended if manufacturers do not establish instructions and standards concerning the service module features of units planned to comprise in the platform of services. (Gremyr et al., 2019.)

3.4. Antecedents and effects of servitization as a change process

Servitization is a multidisciplinary paradox, where not only one approach exists, and inputs have origins in diverse disciplines. In the primary phases, sustainability and IT controlled the servitization research, even though they are now overshadowed by strategic management. The shift of focus emphasizes the strategic significance of the service integration to manufacturers' value creation. (Díaz-Garrido et al., 2018.)

The advanced services of servitization are getting central concentration from academics (Spring and Araujo, 2009; Baines and Lightfoot, 2013). Additionally, the reasons and the profits of competitive advantage concluded from advanced services are starting to be recorded (Baines et al., 2016). These contain development of income and benefits, developing reactions to customer wishes, developing innovation of goods, constructing novel income streams, expanding loyalty of customers, and establishing superior barriers for competitors (Eggert et al., 2014; Ostrom et al., 2010; Oliva and Kallenberg, 2003; Eggert et al., 2011; Baines and Lightfoot, 2013; Gaiardelli et al., 2014b; Saccani et al., 2014; Durugbo, 2014). Mutually, the mentioned factors gather to defensive elements; like competitor's provider layoffs and customer's cost devaluations and offensive elements; like expansion of business for providers and customers (Baines and Shi, 2015). The possibility of these profits is motivating manufacturing companies to discover servitization, especially the advanced services even though there are challenging to deliver for most organizations (Baines et al., 2016).

Additionally, the conclusions of Brax (2005) and Foster and Whittle's (1992) confirm that the strategy of seeing services as "add-ons" is not sufficient for offering high-quality services. Furthermore, as services necessitate a distinctive organizational context than products and their manufacturing, manufacturing product services are challenging to run. Even if the added services would be free and analyzing the market would be seen as irrelevant, it does not justify low quality of services. Therefore, manufacturers are required to have relevance in the client's business procedures and the offerings' performance. Though the focus on services is seen as additional security, changing the business to service-focus with enlarging the entire offering is demanding as services are not in line or cannot be delivered only through the orientation to transaction. (Brax, 2005; Foster and Whittle's, 1992.)

However, Dachs et al. (2014) ratified that in nearly every country indirect income from services is superior than direct service income. Brax and Visintin (2017) discovered in their study that in servitization there are changes in including third actors in production. Furthermore, the change further from enlargement occurs as the company shifts away from the previous value pattern of product dominance. (Brax and Visintin, 2017.)

Sundin et al. (2015) state that product service systems were originally invented to have further sustainable option compared to conventional selling of products gained from improved and more exhaustive material usage. Changing from conventional model to product service integration, it remained implied that product service systems might decrease the environmental affects and deliver profits both for customers and providers socially and economically (Vezzoli et al., 2015). However, some studies indicated that the environmental functioning could get inferior with integrated services in comparison to conventional product sales (de Jesus Pacheco et al., 2019). Indicating that there are many contradictories in the research of servitization about the origin of the change and the outcomes.

The sustainable and environmental side has also surged in the research as an effect from servitization, for example Resta, Gaiardelli and Pezzotta (2009) studied if the lifecycle analysis technique could function for spreading manufacturer accountability to focus on stable environmental and financial profit. Study by de Jesus Pacheco, ten Caten, Jung, Sassanelli and Terzi (2019) states that cleaner production can lead to meaningful environmental and financial profits especially for emerging economies SMEs. This connection of cleaner production and sustainable product-service systems can additionally

create further environmental, financial and social advantages (de Jesus Pacheco et al., 2019). Moreover, other researches have studied the effect of adaptation of advanced services of the industry (Bigdeli et al., 2017). For example, Turunen and Finne (2014) used organizational ecosystem and emergency theories comprising the outcomes of opposing populaces, population concentration, institutional connections, and resource reliance.

3.5. Outcomes of change in servitization

As a conclusion, the main factors of change in servitization are elaborated in the two tables below. These tables further highlight the main drivers of change, the main factors of change management, and the micro and macro factors of change in digital servitization.

Table 1. Main drivers of change and key elements of change management.

| Main drivers of change | Key elements of change management |
|---|--|
| <ul style="list-style-type: none"> • Customer value and its addition (Anderson & Narus 1998; Vandermerwe & Rada, 1988) • Maintaining customers and obtaining new customers (Brax, 2005; Gebauer et al., 2006; Johnstone et al., 2009) • Gaining competitive advantage (Vandermerwe & Rada, 1988; Brady, Davies & Gann 2008; Díaz-Garrido et al., 2018) • Increased requirements of customers and stakeholders (Woerkom & Zeijl-Rozema, 2017; Laine et al., 2012) • Obtaining sustainable lasting revenue (Díaz-Garrido et al., 2018) • Stability and benefits for the business (Kohtamäki et al., 2020; Cui, Su, Feng, & Hertz, 2019) • Globalization (Dangayach & Deshmukh, 2005; Prajogo and McDermott, 2014) • Technology (Huang & Rust, 2017; Belvedere, Grando and Bielli, 2013; Durugbo, 2013) • Economic trends (Jergovic et al., 2011) | <ul style="list-style-type: none"> • Understanding the need/foundation of the change (Meyer, 2007; Paton & McCalman, 2008) • Change management and business partnering of the change (Raja et al., 2010) • Aligning change with goals (Brax, 2005) • Change and strategy planning, selection, and implementation (Van De Ven, 1992; Van De Ven & Sun, 2011; Pettigrew, 1988) • Capabilities and organizational structure and their continuous reconfiguration to meet constantly evolving customer needs (Pettigrew, 1988; Stockdale & Standing, 2006; Bustinza et al., 2018) • Strategic alliances (Raddats & Easingwood, 2010) • Observing network, corporative, business, and functional levels (Baines et al., 2016; Wit et al., 2010; Wheelen & Hunger, 2011) • Authorizations for lower levels that are closer to customer (Neu & Brown, 2005; Baines et al., 2010) • Engagement and communication of change and strategy (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004) • Reinforcing inner integration, central focus, and inclusion of all levels (Sklyar et al., 2019) • Considering environmental features and positioning (Sklyar et al., 2019) |

Table 2. Micro and macro factors of change in digital servitization.

| Micro factors of change | Macro factors of change |
|--|--|
| <p>The internal factors; the aspects in the organization where the change has to be progressed</p> <ul style="list-style-type: none"> • Business model(s) (Brax & Visintin, 2017; Beltagui, 2018) • Organizational culture and structure (Baines & Shi, 2015) • Capabilities, competences, and resources (Kohtamäki et al, 2020; Bustinza et al., 2018) • Products and activities (Confente, Buratti, & Russo, 2015) • Operations and delivery (Raddats & Easingwood, 2010; Gremyr et al., 2019) • Information and knowledge (Confente, Buratti, & Russo, 2015) • Strategic directions (Raja et al., 2010) • Management and power (Raja et al., 2010; Bigdeli et al., 2017) • Inner political features and trust (Bigdeli et al., 2017) • Inner processes and communication (Brax, 2005) • Development and innovation within the company (Baines and Shi, 2015) • HR and performance systems; training, staffing, rewarding, incentive, and appraisal systems (Baines & Lightfoot, 2013; Baik et al., 2019) • Customers and other stakeholders (Confente, Buratti, & Russo, 2015) | <p>The external factors; the aspects that affect the change outside of the company</p> <ul style="list-style-type: none"> • Industry (Brax, 2015; Bigdeli et al., 2017) • Competitors and rivalry (Confente, Buratti, & Russo, 2015) • Environment (Confente, Buratti, & Russo, 2015) • Society (Confente, Buratti, & Russo, 2015) • Technology (Baines & Shi, 2015; Brax, 2015) • Innovations (Baines & Shi, 2015; Díaz-Garrido et al., 2018) • Globalization (Díaz-Garrido et al., 2018) • Economic and social situation (Confente, Buratti, & Russo, 2015; Díaz-Garrido et al., 2018) • Political status and situation (Bigdeli et al., 2017) • Laws and regulations (Bigdeli et al., 2017) • Amplified transportation (Díaz-Garrido et al., 2018) • World's manufacturing base and changes (Díaz-Garrido et al., 2018) |

4. FACILITATING CHANGE IN DIGITAL SERVICIZATION

4.1. Change in digital servitization

Study by Bonfanti, Del Giudice and Papa (2018) analyzed decisions and opportunities of smaller Italian companies, emphasizing especially three following courses. First, highlighting the usage of digital technologies, instead of seeing those as a danger for the company's future. Secondly, including customers in the planning and manufacture practices and enlarging the network. Thirdly, offering an extensive variety of product related services. These courses assist companies to sustain and surge the competitive advantage by seizing chances accessible due to new technologies and methods of producing. (Bonfanti et al., 2018.)

For product companies aiming to servitization inner conversion of business is necessary for improving the resources required to reach the possible benefits (Baines and Shi, 2015). To attain the organizational change required for digital servitization a universal set of vital variables is needed. Different capabilities and resources are essential to construct the resource base required for the change to servitization. (Bustinza et al., 2018.) Additionally, accuracy and speed are crucial capabilities of the strategic agility to develop new business models successfully (Weber & Tarba, 2014). Organizational commitment should be in a key role to guarantee that the set of variables is adjusted with the strategic objectives of the organization, as it simultaneously assists the capability to achieve adaptableness of strategic business units and circumstantial alignment (Selvarajan et al., 2007; Wiener, 1982; Boxall, 1996; Junni, Sarala, Taras, & Tarba, 2013; Zhou, Hong, & Liu, 2013). Profound comprehension of client operations and the way value is created seem to be required to adjust the capabilities and service offerings. These can be obtained from processing information from the suppliers and from internal analysis competences such as in-use observation (Baines and Lightfoot 2013; Ulaga and Reinartz 2011).

Bigdeli, Baines, Bustinza and Guang (2017) altered notions of strategic change research for servitization, declaring that companies ought to reflect three key aspects to implement comparable transformation. These aspects are, considering what changes with the strategy selected, how it changes by considering change process revealing different options, and why

it changes by considering the context of the change in the firm. (Baines et al., 2017.) Companies required to reorganize their strategic business units for production whilst maintaining competitive advantage can experience challenges in the organizational change process (Bustinza, Bigdeli, Baines, & Elliot, 2015). Servitization literature at the moment suggest that organizational paradoxes are experienced when introducing the change to establishing digital integrated solutions mainly due to the shortage of internal capabilities (Kohtamäki, Einola & Rabetino, 2018). Furthermore, Bustinza et al., (2018) state that efficient implementation of services is connected with the most important organizational capabilities, particularly the ones accountable for efficacious organizational change.

Andrews et al., (2018) state that change process has usually been seen as a roadmap where the process is linear. However, they described the process and created a model of “Service transformation game” where the organization goes through the service transformation taking different steps at a time. These steps have factors enabling the change (the ladders) assisting the organization to fast forward some steps, and factors challenging or inhibiting the change (the snakes) that might take the organization back to previous steps. (Andrews et al., 2018.) Baines and Lightfoot (2013) on the other hand suggest three stage process for the product-service process. First stage is the product delivery base services, second the product condition focused intermediate services, and third the capability based advanced services. According to Vandermerwe and Rada (1988) research indicates that the change to provide digital integrated services is a fundamental implication including strategic decision for the manufacturers since it might oblige to allocate vital resources throughout the distinctive servitization stages. Whilst it can take various years until the digital servitization has been able to bring added value and organizational commitment is a former state (Bustinza et al., 2015; Kowalkowski & Kindström, 2013; Bustinza et al., 2018).

On top of the orientation to services and adding them to company’s portfolio, servitization additionally includes the transformation to service orientated logic and business model (Grönroos, 2006; Normann, 2001). This contains changes in the mindsets and culture, which can have fundamental consequences for the organization and its networks (Kowalkowski, Gebauer, Kamp, & Parry, 2017). Johnstone et al. (2014) state that despite the company defeats the “service paradox”; increasing services and producing well economic profit, it can nonetheless confront apparently difficult challenges in the attitudes and culture. The implementation of service culture; including changing the attitudes multiple workers

accustomed to product orientation can be the main barrier for manufacturers aiming for servitization (Davies, Brady, & Hobday, 2006). Additionally, adopting a service culture obliges for participation of clients and main partners in co-formation through the service progression (Aarikka-Stenroos & Jaakkola, 2012). If the business rationales amid these actors are not adjusted, the service creation is not probably going to be successful (Kowalkowski, 2011). Considering the dependence of various manufacturers providers and additional partners, the cultural change might moreover have to include companies in the wider business network (Kowalkowski et al., 2017).

From service business logic viewpoint, the assessment if company is really servitized is not the degree of services and service portfolio but instead if the main drive of the offerings is protecting product business or empowering client value creation. The later involves a readiness to consume the product business for needed ability to gain improved general value proposition. This necessitates leadership abilities outside of the ones required to advance a distinct service business inside of product company or to cherish culture of services inside service particular part. For manufacturing officials, the management and change administration trial is in being adequately responsive to resist new rivals. (Kindström & Kowalkowski, 2014.)

Smith, Maull and Ng (2014) state that company is at the same time offering four diverse value propositions to the same good, opposing the idea of company shifting through different levels of product-service systems. This is supported as the company studied has issues to offer same time four propositions, which are inseparably connected, thus creating greatly complex system. In complicated product service system various client inputs are not identified and the main stage is analysis of the client needs. As in servitization the value proposition shifts the essential offering and companies are required to think the consequences to the assets and capabilities. The aforementioned are not the identical manufacturer's capabilities and information, instead diverse data and the soft abilities connected with clients are required. Thus, executives are required to obtain systems outlook for the value proposition, on top of identifying that shifting the distribution of one value proposal may have unplanned results on alternative value proposal. (Smith et al., 2014.)

However, resource division and obligation are not adequate for the organizational change compulsory for digital servitization implementation (Bustinza et al., 2018). The innovation

of digital services obliges formation of economies of scale and invention of user-focused competences, which both donate to creation of customized integrated solutions (Jawwad, Frandsen, & Mouritsen, 2017). Thus, need for strategic agility appears to be essential, as it integrates the capability to be flexible with different advances, whilst adapting constantly to change and withstanding value generation (Buyukozkan, Feyzioglu, & Nebol, 2008; Weber & Tarba, 2014). Strategic agility is especially helpful for reacting promptly to increasing strategic discontinuities, as promptness is an important aspect of strategic agility in fast and frequently changing circumstances (Swafford, Ghosh, & Murthy, 2006). Nonetheless, hurry without accuracy usually creates errors, thus, it is particularly important for organizations to acquire accuracy capabilities (Wu, Fang, & Wu, 2006).

4.2. Change management in servitization

Each business entity that is willing to grow in the future has to structure change management in its organizational structure as it is inevitably required in organizational transformation and changes (Jergovic et al., 2011). With change management there are many challenges that are not all only considering the change to servitization. The changes cannot be achieved immediately either, variety of organisations have been on the servitization process for many years or even a decade. As a matter of fact, the movement of business servitization signifies an important effect on the directors reflexion and on their management and activities of the business in future. (Vandermerwe & Rada, 1988.)

The change to servitization is not straight nor linear (Finne et al., 2013), instead it can be emergent, bottom-up or iterative change across organizational processes formed and outlined by used business models. For servitization to happen, discussion has to happen among preserving steady processes and the changed or novel ones appearing concluded from the sections of processes (materials, comprehension, experience, and activities). (Palo, Åkesson, & Löfberg, 2018.) These sections are linked, thus, changing one section has effects for the others (Shove & Pantzar, 2005). Furthermore, for change to happen inside of the organization and its marketplace, these sections have to be cooperative (Palo et al., 2018).

In the planned readjustment for service innovation operational and strategical investment changes ought to be reflected through the business model, in a manner that is almost

innovation of new business model. Positive change of one feature differs on the matching changes and rearrangement of other features. Additionally, novel sales manners and client encounter ideas could be needed in the change process. Amplified client comprehension is definitely required since it is the capability to advance relations with new and old clients. Therefore, at times new service creation is highlighted too greatly, without delivering necessary clearness of the innovations for other business model components. The change and implementation process of course also vary among different organizations and over time. Fundamental change probably comprises all sections of the business model and the situation from where the services are started to be developed also varies. (Kindström & Kowalkowski, 2014.)

Directors can utilize business models and the innovation outlook for visualizing in what way and at what time changes may happen leading to increased internal comprehension, transparency, and knowledge of service prospects and changes required. It is essential to recognise the possible dependences amongst sections; as change in one section probably distresses the others. Thus, the preliminary stage of business model innovation is to conclude the existing state and recognise the targeted point, assisting to see the big picture and helping the dialogue of how the business model would be as the targeted point is grasped. The mentioned factors provide directors a superior comprehension of which fundamental changes are required, in which features, and in what order. (Kindström & Kowalkowski, 2014.)

Laudien and Daxböck (2016) studied business model change of manufacturers indicating that manufacturers struggle to find an innovation focused business model plan once challenged by servitization. Beginning from an efficiency focused business model plan, the model change development may occur both straightforwardly and stepwise. The straight tactic is illustrated by a concurrent change of the structure, content, and authority components of the business model. On the contradictory, companies engaging a stepwise tactic are not questioning the entire plan of the model, instead include determined changes of exact business model components whilst contemporarily intending to maintain diverse business model components steady. The outcomes of the study by Laudien and Caxböck (2016) showed that all the manufacturers in the study primarily engaged a path determined, efficiency focused business model plan. (Laudien & Daxböck, 2016.)

Realizing and taking into account the possible critical triggering occurrences and self-strengthening conclusions for these matters improves the likelihood that executives are not imprisoned in a tight possibility of actions that inhibit shifting existing business model plan that is not positive for the company. Nonetheless, amplified consciousness of business model change's path dependence might not unavoidably stop executives to get affected by methods that establish path dependence. Consequently, the significance of outside consultants is often highlighted in the business model transformation as they are not internally rooted in constructions and procedures making it simpler to acknowledge triggering occurrences and self-strengthening assumptions concluding to path dependence of the business model change. (Laudien & Daxböck, 2016.)

According to Trkman, Mertens, Viaene and Gemmel (2015) Business Process Management (BPM) is one process that could be considered in the change to servitization as it intends to advance and direct structural procedures for delivering highest possible client value. Notwithstanding the significance of clients, majority of procedure development exertions and methods inadequately consider the clients. This could be assisted with service blueprinting to create an instrument assisting to obtain comprehension of client connected procedures, as joining those for enhancing the service confront is certainly an vital stage for client focus and beneficial servitisation. (Trkman et al., 2015.) Supporting, to define the processes of servitization further Biege, Lay and Buschak (2012) also developed a new outlook for industrial service blueprinting adopted from Shostack's service blueprinting adding further factors to it. Their model separates two sorts of organizations. Firstly, manufacturers that already have outcome or use adjusted business models still facing difficulties in the operational distribution and therefore are not comprehending the complete revenue possibilities from enlarging the service offerings. Secondly, manufacturers preparing to enlarge the service offering in the close future. (Biege et al., 2012.)

Bustinza et al., (2015) define the servitization change process to consisting of steps that should be completed for successful outcome of the change to servitization. The first step is to develop advanced services so that capabilities can be offered, and value delivered to the customers. Secondly, the executives of the organization ought to arrange production of services to be aligned with the defined objectives of the organization. The third step is differentiation, which the organization can obtain by emphasizing the core competencies across the servitization. The last step requires that the change is enforced to and through

different business units in order for the servitization to create added customer satisfaction. (Bustinza et al., 2015.)

Kanninen, Penttinen, Tinnilä and Kaario (2017) state that once strong comprehension of market of services is obtained, manufactures would need to begin service expansion by classifying the services deliver up to the moment. Additionally, it is required to investigate and comprehend the client needs for founding service base on those. Next action in change to servitization is to outline strategy for services and combine both offices, front and back, to support cross functioning interaction within the company. (Kanninen et al., 2017.) This is also how formation of service culture can be obtained through a specific strategy for services (Homburg et al., 2003). Thirdly, it is recommended to focus on development of novel services and novel business model formation, and pricing rationalities of the services. It is also recommended to transfer one product orientated model of business to various models of business. The fourth phase of change to servitization is improving capabilities and establishing determinable targets and inducements for the sales of services. Lastly, it is recommended to create an independent service management division. (Kanninen et al., 2017.)

Study by Kreye et al. (2015) also highlight the importance of developing right capabilities, as manufacturers likely surge the offerings' degree of service complexity once changing to be a service provider. However, as this change to servitization is occurring, organizations are required to advance especially their relational capabilities like founding interactive customs and conduct, switching information and data, and constructing inner trust in the organizational and personal levels. If the organization does not have contractual capabilities, preparations may conclude in time-consuming, inefficient, and costly agreements. Contractual capabilities may conclude to improvement of innovative methods of interchange control such as affecting regulation of the industry and service modularity. Thus, contractual capabilities permit moderately clear administration of amplified degree of service complexity. (Kreye et al., 2015.)

Although evolving contractual capabilities is essential, the improvement of relational capabilities may operate as a differentiating characteristic in product-service relations. The relational capabilities are required to complete service capabilities, especially at advanced degrees of service complexity, since superior relational capabilities enhance the clients view

of quality of the services. Increase of these capabilities could include for example, rising the visibility of the service provider in client locations and enlightening the client communication quality. In conclusion, for manufacturers aiming to servitization this indicates that on top of improving in the actual service work, they are also required to improve their relational and contractual capabilities. (Kreye et al., 2015.)

Baik et al. (2019) were able to discover evidence of positive connotation amid high performance work systems and employee's competence of provide services. Drive and complexity additionally reinforced the efficiency of high performance work systems in developing service-providing ability. High performance work systems might be essential to connect manufacturing ability with current and new service initiatives (Gustafsson, Edvardsson & Brax, 2005; Baines & Lightfoot, 2013). Furthermore, the internal ecosystem enabled by high performance work systems can add to enhanced service delivery through providing motivation and incentive required for progressively changing demand within the product-service field. As a result, employees develop to be analytical in answering to the fast changing servitization requirements, thus, delivering services with higher quality. (Baik et al., 2019.) The customer sales and service become especially crucial as the unpredictability of the environment grows (Borucki & Burke, 1999).

In servitization framework, high performance work systems can endorse the required independency to encounter different requirements for product-services and improve knowledge diversity (Wright & McMahan, 1992), and additionally assist employees adjust to the servitization accompanied by growing dynamism (Baik et al., 2019). In the dynamic environment, the support of employees can be more crucial as dynamism obliges for combination of information throughout different levels of organization and to understanding of distinct sequences of actions at increased pace (Lepak, Takeuchi & Snell, 2003; Baik et al., 2019).

Additionally, in farther compound environment servitization is more inquiring since servitization recombination requires better internal capacity to organize varied knowledge in the external ecosystem. Various patterns of knowledge need to be combined for tackling the challenges in management, division, and organization of information. (Baik et al., 2019.) High performance systems assist to enable micro-vertical combinations, improve measurement of performance, and customer relationships enchantment (Baines & Lightfoot,

2013). Additionally, high performance work systems help variety of top-down and bottom-up practices to improve results of servitization (Lenka, Parida, Sjödin, & Wincent, 2018), enable the complexity required for distribution of servitization, and improve attention and the collaboration desirable for responding to customer needs. High performance work system is an essential internal ecosystem as it creates a link among employee relations, structure, and procedures that assist to access, incorporate, and implement compound information of product-service combination. (Baik et al., 2019.)

Nudurupati, Bititci, Kumar and Chan (2011) also state that change management and management information systems are in key function to generate efficient ways to measure performance. These applications necessitate a significant quantity of assets and the value will vary based on company's culture and preparation through the lifecycle. Nevertheless, various companies experience challenges to generate convincing reasoning for investments on systems to measure performance as there is regularly elevated vagueness around cost and impact scales encountered. In order to plan the ways to measure performance it is required to consider the causal relations and their quantify, do external observations and recognize different stakeholder needs. Additionally, classifying capabilities, developing objectives and establishing united performance indicators are all needed. Implementing the measures required substantial determination and obligation in different stages of the organization to seize, assemble, analyze and report the data from measuring performance. (Nudurupati et al., 2011.) Thus, it can lead to potential resistance and absence of knowledge needed to create lasting implementation of these systems (Bourne & Neely, 2000; Lewin, 1947). Top management ought to handle the setting and effect the behavior through diverse management style subject to the organizational culture and by becoming involved, as well as changing their ways of doing business. (Nudurupati et al., 2011.)

Supporting, Robinson, Chan and Lau (2016) state that combining novel service offerings across enduring changes for planning and industrial practices is vital. Furthermore, exactly novel practices intended to create value ought to be relation interdependent processes of supply chain procedures inspiring collective innovation, driving associates to advance novel competences, and to compensate suppliers of distributing revolutionary progresses and technical data. Additional crucial part of constructing building the vital comprehension required is assimilating soft- and hardware to products permitting failure observing and prognostic maintenance. To obtain this, novel practices have to be constructed for seizing

system performance statistics and for the system integrator to constantly study system performance. Longitudinal information gathering is likewise significant to advance customer relations for value co-creation and supporting it. However, discovering appropriate, effective, and trustworthy way to finalize information in a beneficial way is a big challenge for many companies. (Robinson et al., 2016.)

It can be seen that there are two main dimensions decentralization and integration in facilitating adaptation and following proficient service activities (Avadikyan et al., 2016). Thus, indicating that for service creation for the manufacturers it is necessary to begin with decentralization of their units, and designate control and decisions to the lower levels of the organization (Avadikyan et al., 2016; Acemoglu, Aghio, Lelarge, Van Reenen & Zilibotti, 2007; Gebauer, et al., 2005; Neu & Brown, 2008). Decentralization enables the organization to be more effective in managing the information distributed between employees, consequently permitting specialists to plan and proficiently direct customer-centric actions (Galbraith, 2002).

On the other hand, the self-sufficiency originated from the decentralization can harm the interaction among further internal competencies and divisions. Thus, integration is seen as the second essential organizational characteristic for the companies targeting servitization. (Avadikyan, Lhuillery, & Negassi, 2016.) Companies ought to integrate the diverse divisions throughout different methods, like formalization, regularisation, cross-functional team or information systems (Galbraith, 2002; Mathe & Shapiro, 1993). These rather are expensive methods and their application is reflected to be efficient by decreasing coordination and communication expenses of divisions throughout improved and quicker alertness of the service divisions and the additional functional divisions or clients (Bowen, et al., 1989; Turunen & Toivonen, 2011). With the mentioned integration methods, teams can be reflected as a key answer to developing customer detailed services promptly (Galbraith, 2002). What makes the teams especially intriguing, is their ability to exploit knowledge by being entities solving problems and potentially increasing creativity particularly whilst delivering complex products (Lenfle & Midler, 2009; Boning, Ichniowski & Shaw, 2007).

Ayala et al. (2019) define “activity system” as one of the business systems dimensions. The activity system can be described as the internal procedures of the organization for developing product related services reflecting several operational characteristics that the manufacturer

has to conduct (Böhm et al., 2017; Gebauer et al., 2012; Santamaría et al., 2012; Wit and Meyer, 2010; Ayala et al., 2019). One of the characteristics is in separate units, departments or teams to integrate the functional procedures and resources (Tuli et al., 2007). Furthermore, study by Paslauski et al. (2016) demonstrated that for successful product related services engineering, combining after-sales support, and improving knowledge allocation actions amongst further functional parts of the servitization process such as marketing, are all crucial.

Concerning the activity system, according to Meier et al. (2010), the difficulty of the procedures for developing and distributing solutions for the product related services may drive manufacturers to collaborations with service providers outside of the organization as these organizations commonly experience shortage of capabilities in the level of operations. Turunen and Finne (2014) also state that various manufactures are defeated in service operations as there is an absence of operational knowledge in this fusion industry. Especially, the capability to offer diverse varieties of services as results, for example altered stages of customization, may be steadily reinforced by service providers (Bastl et al., 2012; Brax and Visintin, 2017).

Additional significant characteristic in the operationalization level is the customization of the solution entity (Durugbo and Riedel, 2013; Mont, 2002). Commonly, further customized solutions are connected with added customer satisfaction and requiring increased proximity and interaction with the clients (Ayala et al., 2019). To create a customized solution entity, it is necessary to develop coherent team and procedures to connect the internal development with the market requirements (Kindström and Kowalkowski, 2009). Numerous manufacturers begin the process of servitization with standardized solution entity such as after-sales services and shift the process of transformation later to the direction of more customized solutions with added customer value (Cusumano et al., 2015; Matthyssens and Vandenbempt, 2010). The given tactic can indicate combined service and product development in co-creation with the customer and delivering value that can elevate loyalty of the customers and intrigue new customers (Durugbo, 2014).

However, upholding a decent service satisfaction degree necessitates usage of novel operative management activities for improved administration of inner capacities or competences accessible. Furthermore, aspects from systems with orientation to products (such as multi-capability and strategy of prioritizing tasks) might offer management devices

with an efficient influence to preserve service satisfaction. (Chalal, Boucher, & Marques, 2015.) When it comes to the leadership style, a study conducted by Kim and Toya (2019) about servitization in Japanese manufacturers concluded that a charismatic management approach augments and enables servitization, while an autocratic and independent approach prevents it. Earlier studies additionally propose that the structures, competences, resources and management, are needed to deliver basic services or services based on products (Baines and Lightfoot, 2013; Biege et al., 2012; Tukker et al., 2004).

Furthermore, in the research conducted by Martinez et al. (2017) the companies studied had all chosen the emergent and evolutionary route to servitization. This occurred as the companies were intensely led by the conventional products. They presented to be good organizationally and technically with delivery and development of products but had to discover services through struggles. According to Martinez et al. (2017) through the primary three years the companies construct the basic services and after cautiously augment some intermediate services to the portfolio of services. Later on, fourth year or after, two matching change courses occur; maintaining the incremental tranquillity in development of services concentrating on basic and intermediate ones and augmenting development of services through discovering and complementing further compound (greatly customized) ones. Thus, drastic and incremental development of services development co-occur although merely on posterior phases of the servitization. (Martinez et al., 2017.)

However, three main elements distinguished the servitization journeys of companies studied by Martinez et al. (2017); the form of phases, the sequential order of these phases, and the concrete implementation. First, the form of phases might conclude the change as clear and beneficial or vague and pointless. The conservative change model states change steps from emerging to development and implementation, and distribution. Nevertheless, the highlighted clarity is one way of proceeding with the change but not necessary functioning as the change path can increase vagueness. The sequential order of phases effects the rational development of the change process as it prevents trails back and forth and accordingly influences on the length of the process. Furthermore, the concrete implementation of the phases can lead to one change process varying a lot from alternative one used. Thus, varying models of change exist and the management and design throughout the change stages depend on numerous aspects, like concentration on client preferences, leadership, networks readiness, resource division, and accessibility of the organization servitizing. The change

process of servitization is not always following a particular route or does not have similar starting points for different organizations. (Martinez et al., 2017.)

4.3. Micro and macro factors enabling and hindering the change

The servitization trend is driven by various supportive factors comprising equally pull aspects like increased client requirement and push aspects like more intense rivalry and weakening profits from products (Viljakainen & Toivonen, 2014). However, study by Benedettini, Neely and Swink (2015) proposes that, addition of services also presents new threats for businesses, therefore, directors ought to explore methods to justify the threats for guaranteeing profitable introduction of services. Martinez, Neely, Velu, Leinster-Evans and Bisessar (2017) studied companies' journeys to services and concluded that all companies researched acknowledged the growing challenge to maintain differentiation from competitors and leadership through competition founded only on products (Cusumano et al., 2015; Eloranta and Turunen, 2016). Data from various companies also demonstrates that to maintain competitiveness innovation of current customer offerings is needed (Raddats et al., 2016). Thus, the companies have boarded the journey of discovering diverse strategies for services to differentiate the collection (Martinez et al., 2017).

Changing especially the business models of services that have earlier been free, can face multiple internal and external challenges hindering the change. One main challenge faced is that the current model is seen as safe and thus, changing it can lead to change resistance. Additionally, the connection of various units within the company can conclude in challenges with collaboration and accountabilities. (Witell & Löfgren, 2013.)

4.3.1. Micro factors

Martinez, Bastl, Kingston and Evans (2010) researched the challenges of servitization and found five main factors that assist with the challenges faced; integrated offering delivery, fixed culture of product-services, strategic configuration, supplier relations, and inner procedures and competences. Superior integration of the offering has straight and rich

propositions for the offering's delivery and planning in the company. Enhanced integration among inner actions is especially needed (comprising demands of further integrated language, assessment, and procedure disposition) among company and the client, and moreover with the suppliers. Integrated movement happens throughout negotiations, designs, manufacturing, development, processes, delivery and further procedures. Furthermore, companies in servitization are growing their participation in aforementioned actions and as a consequence developing their integration. Thus, additional integration necessitates development of the abovementioned five factors. (Martinez et al., 2010.)

Dachs et al. (2014) state opposing existing expectations that the level of servitisation is not linearly connected to the increment of organizations size as they also found high levels of servitization in smaller organizations. Thus, implying that servitisation could be part of a niche strategy that small companies practice getting the benefits of agility in responding to specific requirements of a limited number of main customers. The aforementioned can be also used by big companies for guarding their market segments with differentiation and systems offerings. However, smaller companies might have higher innovation level as they are capable of reacting promptly to new opportunities of technologies and markets. Big companies on the other hand are not so limited by deficiencies of financial markets and may collect funding for innovation more effortlessly. Bigger companies can also manage the risks further effortlessly, concluded from expansion and allocation of the financial failures, on top of more detailed allocation of task leading to evaluated specialization level. Additionally, larger companies have more market share to offer their new products and services. As a result, there seems to be U-shaped correlation between servitization and company's size as both small and big companies have benefits in the servitization process. (Dachs et al., 2014.)

Furthermore, Böhm, Eggert and Thiesbrummel (2017) found out contradictory to previous researches that the size of the organization is a significant factor affecting to successful servitization. The change required needs a vast amount of resources and companies have to assign economic, executive, and staff resources to the service business (Mathieu, 2001). Bigger companies are more probable to have the extra market influence and resources for delivering and gathering necessary organizational changes (Ginsberg & Buchholtz, 1990; Gordon et al., 2000). Böhm, Eggert and Thiesbrummel (2017) found out that the growth revenues bigger companies as for smaller companies it appears to be greatly more challenging to discover an overall formula of success in services. For surging the odds to

enlarge with services especially small companies ought to foresee and assure the distribution of suitable resources. (Böhm, Eggert, & Thiesbrummel, 2017.)

In general, the study by Avadikyan et al. (2016) implies that organizations in low-tech mature industries are not as involved with product related services than the ones in medium- or high-tech industries. In the high-tech industries it is more probable that the manufacturers suggest services with finance or software. On the other hand, servitization strategy is not usually dependable of the age of the organization. However, the size of the organization can harmfully affect the likelihood to offer installation services. On the contrary, big organizations are further disposed to offer services with training and finance. Thus, young organizations are not essentially the ones coming up with innovative product related services or business models but the most important factors are the characters of the industry and specific technological competences that are more important than firm age. (Avadikyan et al., 2016.)

One of the main challenges in servitization is to create and sustain functioning sustainable product service system. Study by de Jesus Pacheco et al. (2019) states that this might be easier for larger companies in comparison with SMEs. The difficulty especially SMEs encounter is the overall struggle change from the conventional product selling business model to model of value-orientation and services and value-oriented model (Kowalkowski et al., 2017; Cook, 2014; de Jesus Pacheco et al., 2019). The change rises the exposure caused by restricted accessible resources and absence of exact capabilities in design, sustainability, and management of sustainable product service model. Bigger organizations are able to attain and adopt the required capabilities and resource positioning more easily. (de Jesus Pacheco et al., 2019.) Additional serious challenge confronted by SMEs is the absence of suitable and appropriate tools and techniques supportive to the change to sustainable product service systems, taking into account their complete lifecycle (Meier et al., 2010; Cook, 2014; Cavalieri and Pezzotta, 2012). The results of the research conducted by de Jesus Pacheco et al. (2019) indicate that majority of the existing methodologies for sustainable service systems are most suitable for big firms.

Furthermore, territorial servitization paths of SME manufactures count on the formation of three compound variables concluding significant types and conditions of internal configurations essential for local beneficial arrangements. These are; variety of focused

capabilities in and around the center of manufacturing, established resolutions decreasing local transaction costs and promote alliances among manufacturers and suppliers, and entrepreneurial efforts for testing innovative business models and novel organizational resolutions. (Beltagui & Santini, 2019.) Spring and Araujo (2013) also highlight the requirement of entrepreneurship in the change to servitization to shift the required factors as needed. Supporting, Matschewsky, Kambanou and Sakao (2018) concluded in their study the main challenges of servitization in provisioning and designing of product-service systems to be connected with determined product orientated mentality and organizational disengagement in planning of products and services.

Business models may be influential instruments to organize and frame servitization exercises. Furthermore, changing the business model or changing to a new business model includes usually duality: managing parallel business models. Normally business models are advanced, changed, and implemented throughout daily activities of a variety of actors from bottom up, not by shifting the fundamentals of a business model from top down. A precondition to improve processes supporting the change is creation of common comprehension, information, capabilities, instructions, and objectives. Directors ought to comprehend that the change to provide services indicates a change of mentality of all workers on how the company should be directed and resources used. The change does not occur instantly, and most likely affects the whole immediate network. Therefore, getting the network committed and trusting is crucial. (Palo et al., 2018.)

Additionally, executives have to recognize the active part that business models have in the servitization and that the implementation is interactive continuing procedure, not distinct from the development of the business models. Companies aiming to servitization seldom may begin fresh, but instead regularly have already a leading, product focused business model besides the evolving service focused model. Employees in front like salespersons often meeting clients, are significant advantage for positive servitization process since they are familiar with client needs and have commonly viewpoints for facilitating and creating value. It is crucial to notice these employees and offer them with the needed resources for developing ideas for services and for converting them to pioneering service. Nevertheless, if the goal is to exit from product focus, executives ought to intrude the firm with novel kinds of experience and abilities. At times these might be found outside of the organization as the

current workers may be trapped in present rules and systems, thus, converted to be a block for the service orientation. (Palo et al., 2018.)

Majority of manufacturers have overtaken a “top down” method to identify strategy for services (Baines et al., 2010). Fewer than half of the companies in the study of Baines et al. (2010) stated to have any organized method for service designing. Furthermore, more than half of the manufacturers had included customers in the service development. Several manufacturers had established further competences for service delivering, especially management, technical, and communicational skills. Additionally, in the study majority of manufactures declared having experienced slight inner resistance throughout the service strategy implementation, even though most likely only with protective services. Moreover, most manufacturers stated having made brief important added investments and having avoided major reorganisation for service delivering (although most likely only with protective services). (Baines et al., 2010.)

Whilst manufacturers have to reorganise the business model and develop innovative internal resources for new business strategy the threat of ineffective servitization normally rises (Benedettini et al., 2015). To overcome the challenges and limitation in the servitization process, the support of service suppliers can be seen as one option (Alghisi and Saccani, 2015; Ayala et al., 2019). Connection with the suppliers permits access to resources that were unobtainable earlier (Bastl et al., 2012). In order to reach the strategic target of the support for manufactures, it is often required to either outsource the service segment or to gain access of the exclusive resources of the supplier (Karatzas et al., 2017; Ayala et al., 2019).

Furthermore, research by Avadikyan, Lhuillery and Negassi (2016) highlighted the significance of product innovation in the product related service offerings, thus, suggesting that profound innovations are essential in servitization. Dachs et al. (2014) also found a connection of servitization and product and process innovation as first of all, innovation of technological processes and products can facilitate novel services. Innovations of technology in such as remote product offerings, GPS, sensor systems, and virtual design enable the description and presentation new service categories and business models connected (Neely, 2007; Santamaria, Nieato, & Miles, 2012; Schmenner, 2009). The competences of innovation are not probable to be limited only to technological innovations, instead they can additionally be appropriate to new services (Dachs et al., 2014). Increasing offerings of services is stated

to strengthen connection with customers (Frambach et al., 1997; Mathieu, 2001) as recurrent communication provides a change to acquire further information of customer needs (Dachs et al., 2014). Thus, servitisation might be observed as an aim to adopt the section of innovation demand pull (Brax & Jonsson, 2009; Goh & McMahon, 2009).

The services are ought to be developed straight by the business function in case source of organization's competitive advantage is customer satisfaction. On the other hand, service entity or exterior partner with expertise ought to develop advanced services in case differentiation is the main advantage used. Organizations on upstream of value chain can achieve superior performance from servitization strategies proposing both customer satisfaction and differentiation. Organizations on downstream can attain improved performance merely from customer satisfaction. (Bustinza, Bigdeli, Baines, & Elliot, 2015.) Supporting, study of servitization in automotive industry by Kessler and Stephan (2013) suggest that variety of services and constant delivery of services is beneficial for existing resources when there is close communication of businesses and with clients. These enable more perceptive to issues with clients; however, automotive manufacturers have detached their services to independent structural entities that might be the reason why the industry has underdeveloped services. As the entity detachment and the absence of client closeness create barriers to develop dynamic capabilities required for expanding the service business. (Kessler & Stephan, 2013.)

The study by Avadikyan et al., (2016) proposals clear impacts for the top executives willing to reformulate their business model throughout product related services as the establishment of these services is not easy to undertake and cannot be achieved by all the manufacturers. It is highly important that the executives assess their products' levels of innovation to recognise the connected opportunities for services. The outcomes of the study by Avadikyan et al., (2016) affirm that for applicable product innovation the overall views resultant from the service product combination, being a front-runner, and development in the knowledge curve are all significant factors. Consequently, the managers in charge of the forerunners, ought to consider carefully the endorsement of their product with product related services in technological industries. (Avadikyan et al., 2016.)

To deal with the decision making of servitization Cui et al. (2019) state that companies ought to have an active view of the risk patterns that the change faces during the transformation. It

is not enough to select and stay with barely one kind of decision-making rationale, instead dynamic method of employing original rationale; an effective rationale or both corresponding to the altering types of risks, is needed. Particularly, at the initial phase of the process when the risk and ambiguity are low, data might be able to be gathered to make forecasts. Whilst at the further advanced phase of the process, like as a performance supplier, it might be difficult or impossible to forecast. Thus, at earlier stages of servitization decision making should be following causal logic and at advanced stages effectual logic. In the stages between, combination of both logics could be used. (Cui et al., 2019.)

Resource base indicates the factors that should be changed in the organization associated with the human resources to handle the product service system offerings. These factors can be for instance competences, knowledge, flexibility, and expertise. (Gebauer et al., 2012; Santamaría et al., 2012; Wit and Meyer, 2010.) Organizational change of the manufacturer is essential for new strategic positioning towards servitization (Kreye et al., 2015). The organization is required to reevaluate its human resources and increase internal flexibility to cope with new dynamic market circumstances of the products and services (Matthyssens and Vandenbempt, 2010; Neu and Brown, 2008). Innovative organizational competences are commonly required for new offerings of services (Brax and Jonsson, 2009). When it comes to control variables, Avadikyan et al. (2016) also found positive connection in the segment of employees from the manufacturers who had higher level education.

Furthermore, human expertise and assets develop to be key foundation for competitive advantage as service offers require direct interchange with the problem-solving and the customer, developing increased solution flexibility (Tuli et al., 2007; Baines et al., 2009). Additionally, employees engaged in the service activities need to be dedicated and proactive as they are required to have increased inter-personal resilience and sensitivity compared to the employees working with products (Barnett et al., 2013). Likewise, manufactures with a servitization strategy might face additional central challenges like issues in the organizational culture caused by the major alterations in the construction of the organization or restrictions in the knowledge of employees (Mont, 2002). Consequently, as the manufactures go through the efforts to improve their resource base in order to tackle the challenges dynamically, they are assumed to gain added benefits from product-service system distribution disregarding of their positioning (Ayala et al., 2019).

The interactive benefits, that cannot be measured economically, can be obtained from connection that users can attain with the service providers. These benefits can be separated to psychological, social, and learning benefits. Psychological benefits occur from the feeling of trust and decreased risk which, the users of the products can sense every day and are straightly resulting from the connection with service providers. Social benefits occur from the social interaction in between the service provides and users, and interaction amongst the users. Learning benefits arise as users of the product related services are exploiting the knowledge of the process or the product and as users get customised and preferred services and offers. (Jergovic, Vucelja, Inic, & Petrovic, 2011.)

According to Andrews, Dmitrijeva, Bigdeli and Baines (2018) organizational culture has been usually connected as the barrier and enabler at the investigation stage of servitization process. The enablers have been connected with accepting servitization in broader market, which consequently improved the probabilities of buy-in within internal stakeholders. Likewise, if the market had absence of acceptance it has been connected with struggles to gain stakeholders, which hinders creating the motion required to move on from the exploration stage. The common inhibitors and enablers linked with organizational culture and capability are power, management, politics, and leadership. The ability to transform has been reviewed relative to the daily actions of organizations and in what way organizational tendencies generally hinder the search for innovation. Nonetheless, recognition of if there is will for servitization there can also be a way to do it has been found in studies and also that suitable inducements ought to be enough for getting the organization across whichever apparent absence of ability. However, even surprisingly technology has been considered only slightly as more than a prospective system to position new offerings of services to attract customers. (Andrews et al., 2018.)

Andrews et al. (2018) state that with the engagement stage of servitization there are various aspects linked with failure and success, in their study these revolved throughout the different transformation in business cases and pilots. Success had been linked with suitable planning and assessment in pilots that were able to assure organization's ability to produce services with profits to internal stakeholders and ability to create value through services to customers. Endorsing servitization as strategy seemed to be connected with value gained from pilots. In case sufficiently estimated, pilots can create confirmation that notifies business cases that can followingly assist protected internal buy-in. The contestants of the study recognised that

in service offerings comprehensive planning and understanding of the complications were crucial in order to proceed from the engagement stage. Additionally, it was mentioned that at this stage it may be essential to evaluate technology, especially the technology obligatory for delivering a specific service as it can be excessively pricey or undeveloped for facilitating service delivery profitably. (Andrews et al., 2018.)

Furthermore, Andrews et al. (2018) state that at the stage of expansion, the success was connected straightforwardly to the engagement stage's success. All contestants of their study alleged that a positive pilot most likely assists to create attention in market and also that concrete team most likely provides a favourable launch. Nonetheless, at more comprehensive level, the greatest challenge of the expansion stage was seen to be the necessity to guarantee that several actions remained continuously on an assured standard. The inhibitors that may arise were connected to this necessity, including pilots with inadequate performance, rivalry internally for resources, incompetent collection or utilization of advertising networks, unsuitable skillsets, and required internal reconstruction of organization. Contradictory, pilots succeeding might commence allocation of resources that quickens the drive of the change process. (Andrews et al., 2018.)

In the study conducted by Andrews et al. (2018) at the exploitation stage of servitization the common problems linked to culture of the organization reappeared. At the exploitation state the company is more devoted to deliver services instead of products. The given different course ought to be constructed based on achievement of the earlier actions. Nonetheless, in the study certain striking occurrences had been described, mainly situations where main internal stakeholders had been substituting persuasive teams or individuals who did not adjust to the servitization model. Additionally, the contestants of the study stated that decreasing interest of the most important customers might be destructive at this point and could arise if marketing had been conflicting with the value creation or service offering. As the main challenge at exploitation stage was seen to be observing the external and internal stakeholders thoroughly, since changes in mindsets and capabilities can be essential for prosperous servitization process and organization. (Andrews et al., 2018.)

According to Avadikyan et al. (2016) the selection of product related services is barely, with few exemptions, influenced by organizational change in route to further adaptable firm or the implementation of new innovative methods to manufacture. Thus, it cannot be stated that

organizational innovation, process and product are discovered to be integral drivers of the services linked with products (Avadikyan et al., 2016). Furthermore, Avadikyan et al. (2016) validated fundamental innovation as the principal factor of the service offerings, on top of validating incremental innovations being effective merely with consulting and training actions and products created to support services. Specified documentation of long-term commitment can be beneficial to even out the resolutions made to meet demands and stakeholder expectancies in the changing and competitive environmental circumstances (Delmar & Shane, 2003; Gomes, Mellahi, Sahadev, & Harvey, 2017; Hart, 1995). Nonetheless, prosperous differentiation concluded from combined solutions is a marathon like competition where the performance can merely be measured in longer period term (Bustinza et al., 2015; Neely, 2008; Visnjic & Van Looy, 2013; Bustinza, Gomes, Vendrell, & Shlomo, 2018).

Kanninen, Penttinen, Tinnilä and Kaario (2017) studied the dynamic capabilities required for servitization and noticed that various of these capabilities focused on the necessity to comprehend the services effect on client value. In various organizations it seems challenging to outline the client value propositions, effect of services is often unclear, and sales of services are challenging to conceptualize. Therefore, it is important for manufacturers to improve dynamic capabilities in the beginning of the procedure to develop services. (Kanninen et al., 2017.) The capabilities contain prospect recognition; “sensing”, investing in the prospects; “seizing”, and constant arrangement of the exact resources; “reconfiguration” (Teece, 2007). All of these dynamic capabilities appeared in the research conducted by Kanninen et al. (2017) in every phase of servitization.

The dynamic relation of the organizational capabilities and resources is beneficial for looking new opportunities and to maintain the competitive advantage (Teece, 2007). In this setting, organizations that have the ability to innovate and discover the usage and positioning of the inner resources and capabilities obtain competency to deliver innovative digital services or to enlarge current services as needed, affiliating their distinguished set of offerings with existing forces of competition (Davies & Brady, 2000). Delivering new digital services assists to develop combined solutions, which is a growing movement and challenge faced worldwide for manufactures (Bustinza et al., 2015; De Propris, 2016). Furthermore, dynamic capabilities are valuable for detecting threats and opportunities, thus, for assisting to conduct

suitable choices whilst altering the offerings (Barrales-Molina, Bustinza, & Gutiérrez-Gutiérrez, 2013; Barreto, 2010).

Technology facilitated the creation of beneficial methods for organization to efficiently integrate requests of customers and to expand new business models for products and services (Bustinza et al., 2018). Bustinza, Gomes, Vendrell-Herrero and Baines (2017) state that due to the mentioned methods it has become mandatory for manufacturers to redefine organizational structures because of the different competitive demands. Being strategically agile assists organizations to implement diverse structures fitting to the environmental setting for investigating the competitive advantage profitably whilst delivering modernised services and products (Yusuf, Sarhadi, and Gunasekaran, 1999). Furthermore, the strategic agility enables election and implementation of the correct structure at the accurate stage, and delivers the rapidity and accurateness needed to endorse the essential change of operation and strategy and to comprehend the prosperity that results from new service business model implementation (Gomes, Weber, Brown, & Tarba, 2011). According to Bauer, Dao, Matzler, & Tarba (2017) strategic agility is fundamental in transformation of organization.

Mainly product focused mindset is perhaps most challenging once digital services auxiliary product consumptions or meaningfully spread the lifecycle of products that mostly will upsurge the pressures among product and service divisions. Thus, it is vital to direct the inner political scenery and to interact the process of change plainly. Additionally, digitalization is prospective to upset industry environments usually seen as old-fashioned or traditional. Rivalry founded digital services contain added suppliers that are not usually observed as straight competitors. The aforementioned rivalry is not restricted to product companies; clients progressively assume that one provider will combine the systems of products, and that it will be done across one digital component like software program. Consequently, multiple soft- and hardware companies might be rivalries and product companies ought to have the necessary digitalization abilities to handle the novel competition and to reinforce client interfaces. (Sklyar et al., 2019.)

If the organization does not have what is required, they can alternatively use external organizations that can distribute integrated solutions promptly and accurately (Bustinza et al., 2018). These strategic alliances amongst external partners can enhance the dynamic capability of the organization without the necessity of managing considerable inner

restructuring (Gomes, Donnelly, Collis, & Morris, 2010; Lee, Hung-Hsin, & Shyr, 2011; Bustinza et al., 2018). Strategic alliances increasing organizational agility are shaped as knowledge-intensive business services of co-operative organisations in the framework of developing integrated solutions (Lafuente et al., 2016; Junni, Sarala, Tarba, & Weber, 2015; Webber & Tarba, 2014). Founded on given statements, Bustinza et al. (2018) assumed that in lack of inner organizational agility, to guarantee the integrated solutions manufacturers are required to alternatively search for external suppliers.

Additionally, the significance of supplier relations according to Böhm, Eggert and Thiesbrummel (2017) varies based on the organization's financial circumstances. For companies experiencing financial difficulties, supplier relations are an essential resource of knowledge. Thus, resilient relations with suppliers should be ensured for gaining the required resources and information for the strategic change to services. (Böhm, Eggert, & Thiesbrummel, 2017.) Suppliers can provide further comprehensions of customers (Homburg, 1998) and function as an auxiliary of involving customers. Furthermore, financially unstable companies could not be capable of dealing alone with the servitization process and have to trust supplier network's offerings of added services (Mathieu, 2001; Kowalkowski et al., 2013; Pawar et al., 2009). As in stable financial situation strong relations with suppliers can be used but are not as vital to secure effective change. Therefore, companies that already have the needed market power and resources ought to concentrate on customers as a main origin of information. (Böhm, Eggert, & Thiesbrummel, 2017.)

Furthermore, Böhm, Eggert and Thiesbrummel (2017) discovered that as manufacturers companies aim for servitization responding to weakening financial state, the lack of solid customer relations arises as a significant requirement. In a situation of financial pressure, manufacturers ought to abstain from deeply relating customers in their central practices (Böhm, Eggert, & Thiesbrummel, 2017). Exhaustive cooperation with customers may necessitate a lot of time and resources that the company might not have (Lau, Tang, & Yam, 2010; Böhm, Eggert, & Thiesbrummel, 2017). On the contrary, for companies with stable financial state the solid customer relations are specifically vital as the most effective manner to plan services filling the customer needs. Furthermore, customers might assist to gain service improvement insight and information, novel services, evaluate models, and future trends (Melton & Hartline, 2010, 2013). Meanwhile, resources of the financial stability and

large size permit companies to handle the expenses of involving customers (Böhm, Eggert, & Thiesbrummel, 2017).

The framework of Bustinza et al. (2018) indicates visibly that it is a requirement for directors to equally comprehend the business environment and to be capable of implementing a strategy most adaptable to latest market circumstances. For conquering organizational conflicts and struggles, it is essential for the directors to have a sharp mindset supporting the implementation of digital business models. Modification of the mindset is required even though not the only sufficient phase. Managers additionally need to modify directorial practices containing organizational culture, human resource functionalities, and certain internal practises and processes. (Bustinza et al., 2018.)

4.3.2. Macro factors

The challenges of servitization can also be created by environmental settings, instead of just difficulties in to make decisions and in the management. Comprehending the organizational setting is extremely vital for executives so that they can select strategic activities and asset provisions, like how far to expand the service offerings from product providing. Tactical shift to services ought to be founded on cautious investigation of the operational ecosystem. Single very significant feature of executive decisions to consider is the worldwide element of diverse actions. Equally appropriateness of manufacturing and service processes in specific parts has to be assessed mutually from competing and legitimating views. According to Turunen and Finne (2014) the factors affecting the competence to servitize are availability of assets, people density, and technological innovations. On top, dynamics of the environment of the company have both enterprises entering and exiting from servitization. Furthermore, the external factors affecting the change are rivalry, availability of resources, innovations, legislation and policies, and institutional linkages. (Turunen & Finne, 2014.)

Study by Ayala et al. (2019) concluded that regarding to the country of the firm and the macro environment it generates the single meaningful outcome was the variable demonstrating countries in the product service systems profits model. Demonstrating that the insight of these profits in an emerging economy such as Brazil is greater than in a developed economy such as Italy (Ayala et al., 2019). This emphasizes earlier researches, like Paslauski et al. (2017),

that discovered emerging countries' economic mostly utilizing services to influence the products vends. Furthermore, having the suppliers included at the given strategic points, the consequences of offerings can be condensed when it comes to anticipated profits as the manufacturer manages to delegate one of the business' key features. As a result, in contradiction to orientating the focus on products the service is not a complementary offering but instead a fundamental one. Thus, firms ought to be apprehensive with suppressing this aspect. (Ayala et al., 2019.)

On the other hand, Dachs et al. (2014) studied further insights of the connection among servitization and location. Their bivariate results assumed that manufacturers Netherlands and Denmark have a greater portion of service revenue, the multivariate investigation explained the supremacy by alterations of industrial arrangement. Thus, indicating that there is not strong if any impact of service culture in diverse countries on the servitization manufacturing quantity. (Dachs et al., 2014.)

Additionally, the competence of individual limited manufacturer to inside establish third operations is commonly narrow. The answer is the regional outsourcing of knowledge concentrated responsibilities and the delivery throughout public or private organizations. (Beltagui & Santini, 2019.) Bast et al. (2012) discovered in their study that this buyer-supplier relation has been changing lately from two-way connection to so called triads, which are find normally in complicated systems needing customization, assistance, and large amount of information transactions. In the triad there is a connection also between the supplier and the client, thus, making the provider to lose its place in the middle. (Bastl et al., 2012.) Supporting, Li and Choi (2009) expressed the outsourcing of services in a triad where the product firm is functioning as a bridge in-between of the customer and the supplier, however the original situation can decay when the supplier develops further direct involvement with the customer. The outcomes of study by Ayala et al. (2019) indicate that the product firms following a product-service system oriented to services ought not to undertake secondary position in the service triad in case it is desired to extent to further advanced level of servitization and the profits gained from it.

Furthermore, the possibility to relocate the supply chain additionally associates with the manufacturer servitisation and change to a hybrid model that has services and manufacturing progressively entwined (Bailey & De Propris, 2014). According to Bailey and De Propris

(2014) several manufacturers in United Kingdom have been fitly positioned to create the kind of solutions and services that the final customers are searching for. Thus, resulting as a way to potentially reach differentiation from the competitors, which can indicate them prospects to co-locate the given activities to amplify the quality of their offerings in the market and providing for the “onshorers” possible competitive advantage. Additionally, the prospective relocation of supply chain making the servitization and change to hybrid model possible. (Bailey & De Propris, 2014.)

In the research conducted by Benedettini et al. (2015) studying why servitization firms fail the mostly usual environmental originators of failing occurred to be financial slump and industry downturn. After that most common factors were rivalry from other countries, expanded fees energy and materials, and lack of success with key customers. Additionally, the outcomes of the study imply that servitized manufacturing firms experience considerably more bankruptcy threat forms than non-servitized manufacturing firms. This indicates that the principal alteration lays in the inner threats’ amount. Nonetheless, servitized firm’s chain of demand additionally has further overall environmental threats than non-servitized manufacturers have. Furthermore, servitized firms seem to face more additional common environmental threats. (Benedettini et al., 2015.)

Benedettini et al. (2015) also discovered distinguishing manufacturers based on the sorts of services offered, the results emphasize that manufacturers delivering services in the chain of demand such as financial, trade, and delivery services are open to larger environmental threats. Contradictory, the outcomes of the study recognize that manufacturers delivering support services of products, such as installation, maintenance, implementation, support, and systems face considerably fewer common environmental possibilities than chain of demand servitized manufacturers, even though not fewer environmental threats than not servitized manufacturers. (Benedettini et al., 2015.)

4.4. Facilitating digital servitization

Several manufacturers are adding services to their offerings to protect their place in the market and raise their revenues, and servitization has extended a notable state for numerous manufacturers in different industries successfully (Ostrom, Parasuraman, Bowen, Patrício, &

Voss, 2015; Dachs et al., 2014). Consequently, further evaluated servitization grade should be wanted to upsurge companies' competitiveness and expanding (Monti, 2010). However, study by Benedettini et al. (2015) suggests that service expansion create amplified threat of bankruptcy. Thus, the manages should be conscious of the threats for services can exceed the advantages. However, servitization should not be avoided, instead it should be emphasized that managerial capabilities have crucial potential to regulate the results of threats in servitization and also that some service types, like demand chain services are riskier. (Benedettini et al., 2015.) Consequently, it is crucial to investigate and concentrate in the different factors facilitating the digital servitization as it has possibilities and successful examples, even though various manufactures also experience challenges (Ostrom et al., 2015).

Starting to be provider of services and on top of facilitating entirely integrated solutions dedicated on lifecycle focus is a demanding mission (Matschewsky, Lindahl, & Sakao, 2018). Especially actions like new processes implementation, integrating and planning of products and services, whilst considering the requirement to alter inducement arrangements and adapting cost methods, on top of organizational configurations, might be intimidating (Matschewsky, 2017; Wolfenstetter, Bohm, Krcmar & Brundl, 2015). To assist with these matters, research by Matschewsky, Lindahl and Sakao (2018) tried to investigate the ways to capture and enhance provider value. As one of the main outcomes, using provider value approach leads to a sharp and organised track of comprehending the wideness of the potential value capturing throughout servitization and further from the offerings lifecycle's use stage. Thus, decreasing the emphasis on economic worth and primary fees of services and enabling assortment of wider, product-service and provider-oriented KPIs that can be used during the planning phase. (Matschewsky, Lindahl, et al., 2018.) The aforementioned process is additionally reinforced with applied documentation for data gathering to enable implementation and continuous concrete usage of the technique (Matschewsky, Lindahl & Sakao, 2015). When the comprehension of multidimensional worth obtainable throughout delivering lifecycle focused product-service systems is widened, a route for gaining the bigger probable offering profits is acquired (Meier, Roy & Seliger, 2010; Tukker, 2015).

Study by Böhm, Eggert and Thiesbrummel (2017) displays that servitization is a applicable choice both for organizations with financial stability and financial weakening. Thus, financial stability is not an essential obligation for positive service changeover even though previous

researches have highlighted the significance of a firm financial environment to handle the needed resources for service business. Consequently, for companies dealing with declining income and customer demand emphasizing and expanding to services may be a viable strategy for rising the complete income. However, success of servitization seems to appear more regularly once the servitization change begins with financial stability. (Böhm, Eggert, & Thiesbrummel, 2017.) Accordingly, while fitting financial situations frequently strengthen companies' existing businesses, eventually it is making them stick with the known effective strategies (Cyert & March, 1963; Greve, 2003). Therefore, companies should pursue service strategies especially when they are financially stable as it is the moment to look and develop novel key resources when the existing ones are working efficiently (Böhm, Eggert, & Thiesbrummel, 2017; Itami and Roehl, 1987).

The study by Matschewsky, Lindahl, et al. (2018) also concluded that provider value evaluation approach offers companies the chance to operationalize the data collected about value of providers to evaluate present offerings for planning improved forms. It can be reached by offering a sharp receipt organisation during the planning state that maintains the purpose of the knowledge gathered. Selected companies view the provider value evaluation as a learning instrument to comprehend the utmost vital alterations among offering products and delivering services. On the other hand, others view it as a chance to analyse the current situation, describe upcoming aims, and record improvement in lifecycle focused increase of product and service factors. As a result, organization are offered with instruments to develop and analyse their offerings, concluding as a better implementation of services and creating improved usage of the envisioned offering profits. The systematic method established has concluded in consistency of process and assisted the interaction with top executives. Especially in the planning state for some organizations the multidimensionality and momentary profit disperse achieved is not something novel, however, might indicate former shortage of organised manner of interacting these subjects. (Matschewsky, Lindahl, et al., 2018.)

Considerable number of attempts to create and form potential answers to the different challenges of servitization have been conducted. Prospective methods and techniques were also important in the case companies studied by Matschewsky et al. (2018), not merely to deliver straight answers or methods for the challenges but moreover for causing actions in the organizations. Consequently, leading to improvement and application of added, inside

motivated methods. As an example, one of the organizations studied appointed position of product service system facilitator with the responsibility to affiliate and progressively integrate planning of products and services. Reaching that resolution was assisted through a prescriptive method, the examination and alteration of planning method for product service systems being vital in recognizing and battling the challenges of servitisation. Creation of the position assisted the case organization to generate comprehension of significant planning problems and to offer interaction configuration for the breach amongst formerly distinct sections. Furthermore, gaining comprehension of the planning and delivering concluded from actor charting demonstrated to be additional valuable and simply implementable method. Lastly, value evaluations of clients and provider and life cycle pricing seemed to be helpful prescriptive approaches for defining and demonstrating the changes in new configuration caused by servitisation and for refining data from knowledge. (Matschewsky, Kambanou, et al., 2018.)

For the change to services and charging from them the main capability company needs to firstly comprehend and communicate are the client requirements to develop suitable solutions and services. Furthermore, the company needs to understand that the required capabilities are rarely found in one company especially with the growing part of technology. Consequently, all the time increasingly companies are required to open up business borders and collaborate additionally closer alongside matching collaborators in its environment partners. (Visnjic, Neely, & Jovanovic, 2018.)

Consequently, extensive collection of resources and capabilities assisting the organization to define industry forces are required for servitization to help firms shape industry forces in their specific market (Windahl, Andersson, Berggren, & Nehler, 2004; Bustinza et al., 2018). Winter (2000) states that also the resource-based view (RBV) of the firm indicates that organization are generating higher outputs than the competitors due to improvements in management and implementation. The RBV view produces competencies for activities such as manufacturing so that the performance of the organization is improved (Helfat & Peteraf, 2003). These kind of resources and competencies are hard to imitate and not transportable (Wernerfelt, 1984). Furthermore, as the competencies and resources behind services are rather intangible, they are normally even harder to copy than products (Michel, Naudé, Salle, & Valla, 2002). The research directed by Bustinza et al., (2018) support the prior conclusions

by emphasising the crucial part of intangible resources for integrated solutions that are reinforced by the organizations improved structure of product-service processes.

According to Benedettini et al. (2015) the RBV highlights in what way companies could advantage from current assets and competences for delivering services. Products supporting services permit better overflow, however, when meant to support compound technical resources throughout the lifecycle, they additionally need the application and administration of wide group of linked competences and resources. Dissimilarly, services of demand chain are commonly concentrated on some sorts of capabilities and resources assets. The study by Benedettini et al. (2015) pointed out that the services of demand chain feature might counterpoise the decreased chances of overflow by reducing the complete inner organizational dispute. Thus, it could be argued that, the RBV are not to be enforced separately when investigating the services' threats. Consequently, quantity of assets and competences included among service delivery is a crucial matter for discovering diverse consequences of threats for service class. (Benedettini et al., 2015.)

According to Hart (1995) for obtaining competitive advantage, it is fundamental to have commitment, distinctive resources, and core competencies. Commitment has been in the centre of debates within management from the time when Walton (1985) recognised that commitment is a distinct tactic to people management differentiating from ordinary control. Wiener (1982) states that commitment is the totality of adopted normative forces acting in a manner of assembling organizational interests and seeing organizational identification as the intermediary element. Commitment-oriented models can be beneficial for innovation development (Selvarajan et al., 2007; Zhou et al., 2013). Furthermore, the findings of Bustinza et al., (2018) support these prior studies, especially when it comes to manufacturers shifting to offer integrated solutions.

Since service variety is probably growing the fees of inner management and organization, with economies of scope opinions highlighting that certain service additions include operational resources novel to the company, and through the idea that positive service distribution necessitates organizational changes in the adjustment of structural design aspects. Significantly, handling with the mentioned inner challenges obliges directorial approaches and methods that might not be upfront for an organization that has been concentrating on products. The results of the existing investigation supplement the current

servitization literature by proposing that some companies are capable of effortlessly and rapidly managing the inner disputes of organizing the service strategy, and hardly any executives are capable to govern the related results of the threats. (Benedettini et al., 2015.)

Furthermore, Kanninen et al., (2017) state that manufacturers ought to concentrate developing marketing, interaction capabilities, and sales, as their research concluded that many companies have the major capability voids in these parts. Nonetheless, improving the capabilities of back office ought to be focused on as well. On top, commitment of salespersons to generate sales of services is crucial and organizations ought to plan and implement inducements and objects that are correspondingly targeted and personalised. Furthermore, IT tools seem to have significant part in helping the service business. (Kanninen et al., 2017.)

Regarding to sales of services, Kindström, Kowalkowski and Alejandro (2015) identified in their research that the main challenge of adding services to product-bases portfolios was the necessity of inner management of processes to sell services. A significant feature seems to be expanding the emphasis of singular salesperson to team or function of sales and including these to further sectors in the organization. Improving team managing capabilities of sales operations might be a chief activity to attain the aforementioned. The necessity for collaboration with service delivers and acknowledging them as a main associate of sales is also emphasised as they sustain the client relations over service life cycles. The collaboration cooperation assures that the confirmed value proposition is grasped and creates ways to obtain the possibilities of value formation in the future. Additionally, the support systems of IT and requirement for official motivation systems seems to be needed in service processes. (Kindström et al., 2015.)

Furthermore, it is required to develop the novel capabilities and skills for the services as amplified value proposition density and client needs call for these in sales functions and personnel. First, client focus capability needs to be obtained; salespeople must have improved and wider comprehension than previously about their clients. Secondly, improved grip of the business reasoning is required, on top of superior capability to comprehend the value creation procedure in client actions. Moreover, the main persons in sales functions and client operations should be educated to understand balance sheets and profit and loss as the service sales and their impacts are different from the product sales. This also assist to gain

capabilities of visualization helping the management and the client integration to the services as a dynamic contributor. In conclusion, it is recommended to implement added problem-solving methods, concentrate on added features besides technological ones in the services, and to be innovative. Additionally, aligned change is required in the structures of delivering services to reflect their part in preserving the service relations and functioning as an originator of sales possibilities. (Kindström et al., 2015.)

Uлага and Loveland (2014) also highlight the importance of sales and that managers ought to realize concretely that sales of combined offerings are not merely an addition to products sales. Therefore, the salespersons who can sell products might not be able to sell services so easily, thus, changes are required since sales force is vital to quarantine the beneficial servitization. The change to services needs attention especially from the lower levels of management with resource recruiting, training, and allocation. Furthermore, the sales entity ought to be planned and aligned with the general business strategies. (Uлага & Loveland, 2014.) On top of sales and marketing entities, it is required also to find suitable ICT and business support substructure. Additionally, novel technologies have to be implemented for serving clients and for the entities mentioned. (Weeks & Benade, 2015.)

Valtakoski and Witell (2018) also highlight that all capabilities are not same as the influence they have for performance differs, and some may be even be harmful. Consequently, considering the capabilities required for services is vital for succession. For smaller companies since assets may be limited the selection of which to invest in is extra crucial. Furthermore, the maturity commands the comparative significance of front and back office capabilities. On top, additional factors like offerings, client features. and competition have an effect in the significance of diverse capabilities. Consequently, it is important to comprehend the setting and SME executives ought to cautiously analyze the environment to devote capability improvement, since highlighting the incorrect capability may reduce profitability. Especially SMEs with various offerings ought to be ready for modification of the service capabilities over time. (Valtakoski & Witell, 2018.)

Strategic plan is the solution to increase offerings and concentrate on at what time to present novel services and in what way to improve and devote in several competences profitably. Furthermore, it seems that especially smaller companies' advantage farther from primary construction of front office capabilities instead of back office since it increases the odds of

positively involving market generating actions and marketing services to novel clients. Additionally, if the market is developed, highlighting inner effectiveness is further probable to generate competitive advantage due to enlarged competition and further founded client relations. For these rehearses like lean and service blueprinting may be beneficial to advance productivity and not to miss client concentration. Regularly, this also includes exploiting technology for automatizing back office procedures to advance consistency and effectiveness. Enriched practice effectiveness moreover delivers fee benefit, permitting the company to possibly obtain client procedures and manufacturing duties for additional growth. (Valtakoski & Witell, 2018.)

Petrulaitiene, Korba, Nenonen, Jylhä and Junnila (2018) studied servitization of workplace, which is a growing business in the field. Based on the study it was also concluded that value offerings in the field have shifted to include services connected to people like consulting, training, and networking events. Researching the value chain of service companies and their partners relations it stood out that the manner services are selected is changing from conventional service level agreement to developing service provider network for service delivery. Additionally, the agreements have shifted to fees based on membership instead of lease contracts and fees alter based on the sort of physical space. (Petrulaitiene et al., 2018.)

One source to gain competitive advantage is the buyer-supplier relations (Dyer and Singh, 1988; Cannon and Homburg, 2001). Solid exterior relations have a significant part in creation and improvement of integrated solutions (Windahl and Lakemond, 2006). Furthermore, services are effortlessly organized throughout interactive exchange and the integrated solutions' delivery needs interactive communications with clients, instead of transactional communication (Zajac and Olsen, 1993; Mathieu, 2001; Oliva and Kallenberg, 2003). Moreover, lasting arrangement of support and services can engage contributing organizations to durable connections (Johnstone et al., 2009). The abovementioned, implies that servitization implementation can have exhaustive implications in the buyer-supplier relations (Bastl, Johnson, Lightfoot, & Evans, 2012).

The relations between buyer and supplier are commonly categorized as relational or transactional, once the relation is cooperative there is more regular interaction and significant information is shared more openly (Bast et al., 2012). One way to research buyer-supplier relations is to use framework by Cannon and Perreault (1999) including five factors;

information interchange, operative connections, legal links, cooperative standards and buyer-supplier adjustments, as Bastl et al. (2012) did in their study. The study indicated that each one of the five factors concerning the buyer-supplier relation are impacted by the servitization process. All these factors should also receive equal attention, even though few need lasting changes in the organization. Thus, during servitization it is recommended to check these factors, to develop communication, and to increase the relations especially with the key suppliers for supporting and delivering combined solutions. (Bast et al., 2012.)

As a result, from business model considering the encircling inter-organizational network and cooperating associates, firms may produce superior chances for service delivery improvements, spread risks and share responsibility, and find sustainability. The networks and novel forms of ecosystems guarantee developed capacity and wider selection of resources. Several companies may unite strengths to deliver diverse experience and abilities, thus, face the multifaceted challenges better. (Parida & Wincent, 2019.)

Additionally, in order to gain sustainability of the service integration it is suggested to strengthen network, mostly to reserve support and information for uplifting the outside ecological pressure down to the supply chain, as well as inner knowledge of environmental effects, technology allocations, and assets (de Jesus Pacheco et al., 2019). Accordingly, these networks can come vital to focus on the general issues dominating industrial ecosystem, company flexibility, and sustainability of global supply chain (Moore and Manring, 2009). Concerning sustainability evaluation of sustainable product service system offerings following instructions are recommended by Sundin et al. (2015). First, sustainability motion ought to be amended to company's needs fitting the area of activities. Secondly, the quantity of motion should be limited as possible to decrease added work and what the services are offering. Thirdly, the motion has to be advanced in collaboration with existing and prospectus clients. Accordingly, while developing diverse scenarios of service delivery, the motion will be applied to help the selection and conclusion. (Sundin et al., 2015.)

In order to develop the sustainability of the organization further, the business model could be changed to circular model. The phases of change to circular model are similar as the change of business model for servitization as well. First, the change needs to be observed, then present business model examined. After that the new model needs to be designed and scaled-up. (Frishammar & Parida, 2019.) In conclusion, to obtain sustainable service systems novel

mindsets, substituting the exchange value to use value, and comprehending the idea or the product-service system are all needed. Even in the absence of supporting techniques and models for the change, the aforementioned strategies to defeat obstacles of gaining sustainable product service offerings would seem beneficial. (de Jesus Pacheco et al., 2019.)

The study by Avadikyan et al., (2016) proposals clear impacts for the top executives willing to reformulate their business model throughout product related services as the establishment of these services is not easy to undertake and cannot be achieved by all the manufacturers. It is highly important that the executives assess their products' levels of innovation to recognise the connected opportunities for services. The outcomes of the study by Avadikyan et al., (2016) affirm that for applicable product innovation the overall perceptions resultant from the entirety assumptions of services adjoining products, being a front-runner, and development in the knowledge curve are all significant factors in successful product related services. Consequently, the managers in charge of the forerunners, ought to consider carefully the endorsement of their product with product related services in technological industries. (Avadikyan et al., 2016.) Kanninen et al., (2017) also mention based on their research that some organizations recognised difficulties to commit management to the services. The services offered might gain better trustworthiness within the company and staff would possibly have more commitment for service sales and marketing, and the company would gain more profit and loss liability through a distinct service business management. (Kanninen et al., 2017.)

In a study conducted by Baines et al. (2010) many manufacturers saw their strategy for services prosperous, on top of being able to react to competitive forces and economic changes and being fundamental for the growth. Many manufacturers also stated profits in sales of services to be higher or equal to sales of products and saw services as the key of their strategy for growth. (Baines et al., 2010.) Also in the research conducted by Kanninen et al. (2017) service pricing demonstrated to be one issues for manufacturers. The companies studied highlighted the significance of outlining diverse pricing models for distinctive services and client segments. (Kanninen et al., 2017.)

Szász and Seer (2018) debate that demands from stakeholders may affect the implemented strategies of manufacturing companies, containing also strategies focused on services. Especially the demand for sustainability from stakeholders is stated to be significant aspect

that may lead to companies implementing operational strategy focused on services. However, for efficient servitization this strategy obliges for rearrangement of operational assets and procedures to allow delivering diverse services effectively beside the products. Furthermore, it seems that delivering only basic product-based services is not sufficient for grasping amplified performance comparative to rivals. Merely, advanced customer-based services seem to be able to offer competitive advantage to companies, even though product-based services are in vital part since they offer a stand to proposal additional advanced services. The manufacturers with advanced customer focused services seem to have, compared to the competitors, greater operational abilities, which leads to higher performance and profits. (Szász & Seer, 2018.)

Furthermore, related to superior sustainability performance the customer focused business model of services inspire companies to better and more efficient usage of assets and to be more responsible with product manufacturing, usage management, recycling, and disposal through the life span of the products (Manzini and Vezzoli 2003; Williams 2006; Szász & Seer, 2018; Beuren et al. 2013; Tukker 2004). Implementing specific aim of operational strategy requires to line the competitive primacies with the market demands (Szász & Seer, 2018; Szász and Demeter 2014). Nonetheless, offering barely product based services will not conclude in advanced performance of sustainability as executives willing to answer to demand for sustainability are required to reach at a point where the organization is capable of delivering advanced customer based services. (Szász & Seer, 2018.)

To tackle the issue of how to manage servitization in the manufacturing firms, Avadikyan et al., (2016) proposed that executives with innovative products must pay special attention to the possibilities of training services and consulting when not being within the technological boundaries. The possibilities in repairing and documentation services should also be primarily investigated. Coordination several product related services, the executives should carefully consider the improvement of resilience of their servitized organization. International significance of using these suggestions can lead to even higher return rate of the services that suggested in the previous literature. Notwithstanding the seeming failures of product related service strategies amongst industries are that managing directors of flexible organizations and technological pioneers should be less hesitant when seeing the previous lower return rates of product related services. (Avadikyan et al., 2016.)

Conclusively, the competencies and agility of the organization are connected to general effectiveness of operating and higher level of customer service (Buyukozkan, Feyzioglu, & Nebol, 2008). The organizational agility may result to support the capability of decision-making assisting in assessment and assortment of suitable strategic alliances (Gomes et al., 2011). For customer service it seems crucial to reconfigure the information channels, which are the main points to engage customers and conclusively enrich the product-service portfolio of the organization (Bustinza et al., 2013). Thus, strategic agility enables make-or-buy choices regarding proficiency of the processes and organising the supply-demand chain that are both perceived as most beneficial strategy for the manufactures to adopt (Yusuf et al., 1999). The study by Bustinza et al. (2018) confirmed the topics stated and recognized product companies' willingness to externally create and improve merged solutions merely if the capability for agility is lacking.

In general, there are many challenges with models for digital business and the model implementation needs foremost effort to change the organization and to be committed in long-term (Vendrell- Herrero et al., 2017). The research by Barrales-Molina et al. (2013) suggests a structure for organizational change in product companies, which could be adjusted to further industries. Barrales-Molina et al. (2013) claim that resource base and commitment of the company are crucial aspects to position integrated digital solutions, since those are not accessible external from the company's borders. The beforementioned indicates that companies ought not to barely acquire intangible capabilities and resources of implicit acquaintance, but as well build commitment throughout plainly described plans of servitization for longer term (Delmar & Shane, 2003). Commitment empowers rapid, conclusive restructuration of organizational capabilities and resources to adjust with the altering settings and objectives (Bustinza et al., 2018).

Furthermore, Weber and Tarba (2014) complement to the significance of organization's agility, seeing it as a competence that could be also developed in cooperation with other firms or subcontractors even though it is key in creating and improving digital integrated solutions (Weber & Tarba, 2014); Bustinza et al., 2018). The effectual logic should also be used in situations of high uncertainty and difficulty to forecast patterns of risk, such as when creating performance-based solutions and when no applicable information is accessible. In the given situation the resources available, like expertise, networks and knowledge, should be used rather than outlining before an exact aim for the pursuit. Moreover, the experiment should be

applied first by choosing a small amount of representative clients to analyze and test ideas inside the affordable cost scope. Mostly, it is significant to co-create value with clients, suppliers, and agents in order to take advantage of resources and competences of the supply chain. (Cui et al., 2019.)

Furthermore, the risks organizationally, strategically, and operationally ought to be frequently assessed and suitable logic of decision making implemented for governing the aforementioned risks. For governing organizational risks, to develop and provide services with high quality personnel and organizational structures should be reformatted. To govern strategical risks, service competences should be developed, and services resources joined so that business model can be enhanced to improvingly encounter the altering demands from external environment and clients. When it comes to governing operational risks, consideration should be paid to customer demands and improved solutions created in sales, development, pricing, and quality of services to reach the customer needs. (Cui et al., 2019.)

Executives willing to maintain products as the fundamental interest can have contractors in supportive functions and include them in the selection of strategies for solution offers. The executives may additionally ultimately assign the implementation of services entirely to co-operating suppliers. Nonetheless, executives willing to take further profound process of servitization concentrating on the profits of service orientation ought to be alarmed to create firm particular strategy for offerings whilst exploiting the support of service suppliers for inner development service operation improvement. In the given situation, firms should aim to create knowledge with the assistance of the suppliers instead of assigning actions completely to the suppliers. (Ayala et al., 2019.)

Research conducted by Baik, Kim and Patel (2019) emphasises the HR systems' vital part in developing skills of employees for provisioning services. On top of significance of exterior networks to implement servitization intentions, high performance work systems can establish the foundations of an inner network enabling communication through various organizational levels. As a result, company is able to enhance investments in exterior relations by additionally exploiting high performance work systems to develop features of the organizational structure. Another added benefit of the high performance work systems is that they are increasing the abilities to provide services dependent of the industry. Thus, companies ought to improve and advantage the work systems in the industry given

framework to exploit the potential of employees providing services. The high performance work systems assist to improve, reinforce, and support an inner network of HR systems. Thus, enabling the organization and arrangement of resources for services and manufacturing through different stages of organization and taking advantage of the servitization intentions through customers. The exterior ecosystem moreover has a probability influence in the worth of inner positioning to develop organizational performance. (Baik, Kim, & Patel, 2019.)

Based on study and recommendations of Chalal et al., (2015) there are three actions to improve servitization process. First actions are devoted to ratifying and strengthening the service orientation with the aim to improve service satisfaction rate. These were, creating a novel type of position, combining manufacturing/back office and service/front office to obtain greater resource allocation resilience, and introducing a new training plan to rapidly increase total multiskilled capabilities. These actions highlight that resource allocation and HR management seem to lead positive performance. Furthermore, the third action targets to sustain satisfying performance of manufacturing even when the priority is at service, such as restructuring final-product warehouse and novel stock managing strategy resulting in improved safety of inventory levels. This emphasises the fundamental matters of challenging service implementation mandatory to discover the correct stability among industrial performance and service orientation. (Chalal et al., 2015.)

Cassia, Cobelli and Ugolini (2017) studied B2B brand image and customer loyalty and found out that the image is not formed only by the company but instead created in clients' minds. Thus, the development of brand image can be affected straight across communications with the client and across marketing communications obliquely. The research also proposes that brand image is shaped interactively during time and that single actions to construct brand direct to revenue reduced performance. (Cassia, Cobelli, & Ugolini, 2017.) Kunz and Hogreve (2011) studied service marketing and discovered that the scope ought to be widened for creating connection from inner executive decisions to outside estimates and performance of company that may assist to improve and administer the value chain of services. Additionally, since organizations face increasing volumes of information and find developed data evaluation methods, they also need high-level CRM tools. The service recovery and criticism treatment as well seem to remain in a key position for managers and researchers. These factors are vital due to growing pressure of market dynamics and diversity from operative service recovery managing that ought to continue as central factor to obtain

competitive advantage. (Kunz & Hogueve, 2011.) Novel manners of delivering services also oblige for diverse strategies of service recovery (Robertson & Shaw, 2009).

Furthermore, the tactic of branding with products should be mixed with the service branding. The conventional tactic concentrates on branding the manufacturing as it has optimistic influence on client satisfaction and loyalty implicitly. However, the service branding seems to have added and straight influence on loyalty of customers as the brand creation appeals to the customers as assisting them to create value. Consequently, manufacturers ought to be “serving” the clients for positive branding in servitization. Branding of products motivates customer satisfaction, but service-related branding arises sense of loyalty and commitment of customers. Nonetheless, the brand images are not jointly restricted but can collaborate together. (Cassia, Cobelli, & Ugolini, 2017.) Solid service-related brand can be seen as an associate willing to improve their performance (Cassia, Cobelli, & Ugolini, 2017), making branding significant also in the change of servitization.

Additional factor facilitating the servitization can also be product positioning. Research by Cassia, Ugolini, Cobelli and Gill (2015) states that service-based positioning of the goods perception is at times, even though not repeatedly, capable of generating greater customer apparent value than products-based positioning. Service-based positioning may especially improve customer apparent value when the awareness of the goods is poor, surging equally social and emotional values. Contradictory, if awareness of the product is elevated the product or service bases positioning does not change the experienced value of the customers. In this situation with high awareness, products-based positioning is capable of lifting the apparent quality value of the good image. All in all, the servitization might not always be successful and the manufacturer can choose to highlight either product or services based positioning, varying on the aimed customer segments and their degree of awareness. (Cassia et al., 2015.)

According to Crowley et al. (2018) it is important for the managers to have rational acknowledgment and concentration on the decision for servitization. Thus, it is important to recognize the requirement of added managerial training and potentially hire new managers, as well as to discuss about best procedures and tactics to attain united servitization. The study by Crowley et al., (2018) implies that servitization objective requires to be planned and administrated equally at operational and executive stages as a factor of the servitization

development, especially to consider the necessity of configuring strategic resolute through the company. Consequently, having impacts on strategical planning, resource obligations, and to the choice of directors to manage the change. Managers with larger background in the industry might have superior unwillingness for the change towards service orientation. Thus, they might concentrate on upholding the existing business model and to operate services as an auxiliary business model or concentrate on the servitization barriers so that they are not keen to create meaningful changes. Fast change might necessitate hiring managers from other industries to manage the change, since they might not be so burdened or captivated by the present business models of the industry. (Crowley et al., 2018.)

The intent for the servitization, its measurement, and comprehending the hostile performance connected to different clients are additionally important as studies by Crowley et al. (2018) and Reim, Sjödin and Parida (2018) state, as not being able to do the aforementioned factors may lead to critical financial consequences. The evaluation intent of servitization could be done by using a target measurement, the service profit level divided by total profits (Fang et al., 2008), as a neutral objective for the anticipated future servitization level (Crowley et al., 2018). Supporting, Reim, Sjödin and Parida (2018) present three main agency instruments that may mitigate hostile performance of profit focused product service systems; trust, monitoring, and contribution. Furthermore, joining the instruments of trust and the usual behavioural and profit focused agency instruments considerably increases the comprehension of several instruments that may benefit from mitigating hostile performance. All of the instruments have their assets and disadvantages, nonetheless, are still suitable for resolving specific kinds of issues. Such as, sharing instruments are recommended in situations where client has solid concentration on costs and trust instruments are normally needed if handling client monitoring and contracts. (Reim et al., 2018.)

Furthermore, assessments and mapping of risks is recommended to create further analyses of different risks and their levels. Constant assessment of the situation is also needed, as hostile behaviour of clients may occur at any point, thus, it is needed to revise and align the aims for client relations constantly. Nevertheless, this process is not easy and can be rather complex, requiring organization of executives to reflect diverse features of the behaviour. Additionally, it is important to create distinct conclusion for every precise agreement and relation, on top of assessing this conclusion through time. Not being able to administrate hostile behaviour of product service systems may generate conflict in the organization for prospective service

offerings. Thus, potentially concluding in negative ecosystem effects as sustainable service agreements considerably lead to added resource exploitation. (Reim et al., 2018.)

Moreover, altering competition and demand of the industry generate the motivation to transfer to services for increasing competitiveness and practicality (Kamp and Parry, 2017). Rapid changes of business model may be viewed as disruptive (Vendrell-Herrero et al., 2014; Gebauer, 2009) and might appear as unwillingness to implement vivid changes to service business model as threat evading can result in unsuccessful servitization (Gebauer and Fleisch, 2007) and even to a change back to product orientation (Finne et al., 2013). Therefore, even companies recognise the necessity of change to services, they are hesitant to change out of fear of interrupting the current model, which leads to change paradox in the industry (Crowley et al., 2018). Thus, understanding and compliance within stakeholders is required to effect intention, willingness, awareness, and trust (Malle and Knobe, 1997). Additionally, transparent communication of also the potential long-term threats might be required. (Crowley et al., 2018.)

In most cases, the change of business model throughout servitization creates tensions. These tensions can be originated from stability of the servitization intent, common attitudes, and managerial narrowmindedness resulting from industry rules. To deal with the conflicts confronted, gently phased tactic appears to be best suited to reduce tensions across the organization and processes. On top, the newcomers of the industry additionally enforce major change creating requirements of change for all the parties. (Crowley et al., 2018.)

5. AGENDA FOR FUTURE RESEARCH ON CHANGE IN SERVICITIZATION

This research concluded various different sections and factors of digital servitization and change that could be studied further. These notions for future research were gathered from the literature review conducted, thus, they present vivid outlook on what parts of the field are still missing further investigation and what specific topics could benefit from additional investigation and research. The future research sections are divided to regard servitization, change, and the antecedents and outcomes of these. It seems that the field of servitization, both the research community and practitioners, could highly benefit from additional research and there is still variety of research topics to be covered in the field.

5.1. Future research regarding servitization

According to Ostrom et al. (2015) identifying the most effective ways that smart technologies generate and clarify new business models could be researched further. Furthermore, the current research demands practitioners to comprehend servitization farther and being capable to collect customer feedback, data, include smart software, etc. for positive servitization. However, it may be challenging to invest several assets required for the advance services. Thus, considering servitization composed with the improvements of technology and their influence on service selections of business models could be researched additionally with future research courses. (Tauqeer & Bang, 2018.)

Bustinza, Bigdeli, Baines and Elliot (2015) on the other hand called future research to recognise mediators, which might mediate in contradiction to change of servitization and represent in what way advanced services make entering the market added compound and expensive to lock out rivalries. Furthermore, to obtain deeper understanding of digitalization, future research could combine information systems and marketing researches that are gradually considering ecosystems and innovation of services. This would also call for further research on the altering part of technology and the obscuring limits of technology and people in service environments. Additionally, since growing number of companies follow digital servitization, quantitative approaches may be considered to assess the efficiency of central

knowledge decision making and to evaluate the effect of main companies in their environments. Also the interaction amid several environmental features and digital servitization driving factors would need further investigation. (Sklyar et al., 2019.)

Concerning performance, further research could also be conducted on the auxiliary mediators and moderators additionally unloading the not linear connection of firm's performance and digital servitization. Moreover, the variety of outcomes of digitalization ought to be studied further, like factors of firm's market value and increased sales. (Kohtamäki et al., 2020.) The changes that digital servitization creates to bargaining power of various parts in value systems and environment and how it could be increased with servitization ought to be additionally studied as well (Kohtamäki et al., 2019).

Regarding to future research with the micro factors, the required detailed management abilities and organizational competences essential for advantaging from digital servitization to generate dividing instruments and produce competitive advantage seem to be requiring additional research attention (Sánchez-Montesinos et al., 2018). Supplementary, profound qualitative investigations might also assist to create added specified comprehensions of the wanted abilities, micro foundations, and exercises (Kohtamäki et al., 2020). On top, also quantitative methods of service delivering competence using micro level worker performance information or data envelopment examination of company could be developed (Baik et al., 2019).

Furthermore, different organizational factors and processes enabling to create client value or the co-creation with assets and competences like performance management systems, organizational cultures and IT systems ought to be researched further. The field of servitization could also profit if the micro factors of the servitization strategy implementation process would gain added research interest. (Rabetino, Kohtamäki, & Gebauer, 2017.) These micro factors to be researched in the future could be the strategic capabilities of digital servitization and enlightening the way they create competitive advantage and what is required to obtain and improve them. Additionally, the study of required dynamic capabilities and their part in reorganization of resources could be broadened. (Kohtamäki et al., 2019.)

The environment of the digital servitization could also be further researched (Kohtamäki et al., 2019), as well as the different macro factors of it. From the client side, Avadikyan,

Lhuillery and Negassi (2016) call research to identify clients' features and parts of servitization procedures. Also, the collaborations with other firms ought to be studied, as in many cases of servitization it is relevant and required for combined digital offering. Thus, the strategic alliances, mergers, and acquisitions could be studied further detailed, on top of researching the contracts and results amid manufacturers and outside service suppliers offering accurateness and rapidity competences (Bustinza et al., 2018).

Moreover, research of servitization ought to spread outside of the leading separation of developing and developed countries to further unbiased global range. This would assist to demonstrate if servitization is something that occurs more in western companies or is it worldwide. Additionally, it would assist to create more visibility for servitization in the developing economies and help to confirm, expand, and enhance current information. Furthermore, future studies could investigate if firms are more likely to implement servitization in the situations of facing threats or to which degree the competition experienced is linked to the polarization's stylistic strategy. (Luoto, Brax, & Kohtamäki, 2017.)

5.2. Future research regarding change

Szász and Seer (2018) suggest that further research on change ought to provide additional assistance to executives on which way to shape their service processes for grasping the uppermost potential competitive functioning, comprising sustainability profits. Furthermore, the qualitative and quantitative data of change and servitization enabling and hindering factors could be conducted (Andrews et al., 2018). Especially the servitization and the micro and macro factors that are enabling and hindering change ought to be further studied with different methods to gather data and information from various companies operating in different industries to support and take this research further.

Similarly the effect of technology and digitalization and in which way they assist, not destroy, services could be researched more to also measure and discover different factors (Avadikyan et al., 2016). Wiesner, Marilungo, and Thoben (2017) additionally state that future research ought to handle more the services implementation for companies to be able to change between the business models exclusive of data defeat or postponement. Moreover, companies with reputation of further progressive and refined service delivery have stated to be gone

through substantial organizational change. Therefore, this could be studied to understand, for example in what way the change is connected to service strategy and its selection. (Baines et al., 2010.) Also investigation of the organizational change occurring once new supplier is introduced as prospective collaborator to implement services could be conducted (Ayala et al., 2019).

Furthermore, additional studies of digital servitization could be conducted to specify in what way the digital servitization change process affects the manufacturer's organizational culture and identity (Kohtamäki et al., 2019). This could be studied both inside of the organization and within its stakeholders and environment. Consequently, especially the short- and long-term effects of the change to digital servitization could be investigated further with various different outlooks and observing different sections that might have been and have been affected.

5.3. Future research regarding antecedents/outcomes

The change and outcomes of servitization could be additionally studied especially with the sustainability view, such as with the usage of circular economy and obtaining of it. De Jesus Pacheco et al. (2019) as well emphasize researching servitization's change, results, and sustainability especially to considering usage and seizure of circular economy. Auxiliary, Díaz-Garrido et al. (2018) highlight the importance to inspect the servitization process of operational instruments to change society towards resource effectual circular economy and to create ecological profits.

Considering different factors affecting the digital servitization, micro factors alter boundaries of the company as decisions of outsourcing are required (Kohtamäki et al., 2019). From the macro level, on the other hand, these changes in boundaries of the company alter the parts, collaboration, competences, and value systems amid different acting parts (Rabetino & Kohtamäki, 2018). Moreover, the environmental structure and strategic gatherings are affected reshaping industry and its settings (Kohtamäki et al., 2019). All in all, these lead to various potential future research ideas that could be investigated further.

One of the potential future research ideas related to different theories of the firm and servitization is researching their interaction together and combined with Internet of Things. Furthermore, researching the interaction with theories of the firm might enlighten additional insights of digital servitization's business model formations, thus, should therefore be investigated further. Additionally, the factors that assist digital servitization to create value and how the seizing of value occurs with the changes from product focus to service focus and even data focus in some cases require more research attention in the future. (Kohtamäki et al., 2019.) As the value created often leads to increased organizational performance, Valtakoski and Witell (2018) propose that future research ought to investigate servitization's effect on company's performance especially considering the organizational capabilities. These could be researched especially in the future considering the longer-term effects, that are not yet possible to be seen as digital servitization is rather new phenomena.

Since business models and their formation for integrated solutions seems vital in the servitization process, further indications to comprehend in what way digitalization outlines the capability to involve further actors in the environment distributing advanced value to clients would be needed. (Kohtamäki et al., 2019.) On top, co-creation of business models with the network partners ought to be investigated further as it would have even greater potential impact on the value delivered, and the efficiency and potential of the change.

Additionally, if market maturity and commodity are connected with servitization (Luoto et al., 2017) or even causing it from the macro view for some organization could be studied. Furthermore, it could be further elaborated that for which type of manufacturers servitization is beneficial and has it been beneficial for companies pursuing it (Luoto et al., 2017), especially given the change required and potential risks that have to be taken and uncertainty to be accepted. This could be studied also industry wide, to see further the differences and different outcomes of companies in the same macro setting. Moreover, the risks from servitization change and their classification, evaluation, and assessment have potential for future studies (Benedettini et al., 2015), on top of offering solutions how to handle and prevent these risks.

5.4. Synthesis

To gather the research ideas concluded in this study, the table below was created. The table demonstrates the different sections and notions of digital servitization, change of servitization, and the antecedents and outcomes of servitization that could be researched further.

Table 3. Agenda for future research of digital servitization, its change and outcomes.

| Focus area | Topics |
|-----------------------|---|
| DIGITAL SERVITIZATION | <ul style="list-style-type: none"> • The effects of technology and people (Tauqeer & Bang, 2018) • Most effective smart technologies to generate and clarify new business models (Ostrom et al., 2015) • Most beneficial technologies and selecting the right ones (Tauqeer & Bang, 2018) • Mediators of change, factors that make entry barriers for rivalries (Bustinza et al., 2015) • Usage of information systems and marketing researches (Bustinza et al., 2015) • Interaction of environmental factors and servitization driving factors (Sklyar et al., 2019) • Mediators and moderators of performance and servitization (Kohtamäki et al., 2020) • Micro foundations and exercises (Kohtamäki et al., 2020) and the usage of micro level information and data (Baik et al., 2019) • Usage of different systems and data; e.g. for performance management, IT, and organizational culture (Rabetino, Kohtamäki, & Gebauer, 2017) • Strategic and dynamic capabilities of digital servitization (Rabetino, Kohtamäki, & Gebauer, 2017; Kohtamäki et al., 2019) • Needed management and organizational capabilities (Sánchez-Montesinos et al., 2018) • Assessing efficiency of central knowledge decision making (Sklyar et al., 2019) • Servitization strategy implementation and suitable business models (Rabetino, Kohtamäki, & Gebauer, 2017; Wiesner, Marilungo, & Thoben, 2017) • Situations and conditions where digital servitization is mostly implemented (Luoto, Brax, & Kohtamäki, 2017) • Environmental and client factors and their interaction (Sklyar et al., 2019; Lhuillery & Negassi, 2016) |

| | |
|---------------------------|--|
| | <ul style="list-style-type: none"> • Effects of main companies in the industry (Sklyar et al., 2019) • Additional ways to gain competitive advantage and to lock out competition (Sánchez-Montesinos et al., 2018; Kohtamäki et al., 2019) • Changes and bargaining power in value systems and environment (Kohtamäki et al., 2019) • Potential ways of collaboration; strategic alliances, mergers, and acquisitions and their effects (Bustinza et al., 2018) • Research based on both developed and developing economies (Luoto, Brax, & Kohtamäki, 2017) • Competition and its linkages to polarization (Luoto, Brax, & Kohtamäki, 2017) |
| CHANGE OF SERVICITIZATION | <ul style="list-style-type: none"> • Shaping service processes and change (Szász & Seer, 2018) • Enabling and hindering organizational/micro factors (Rabetino, Kohtamäki, & Gebauer, 2017; Andrews et al., 2018) • Enabling and hindering environmental/macro factors (Kohtamäki et al., 2019) • Roles of technology and digitalization (Avadikyan et al., 2016) • Technologies assisting change and how to exploit them (Avadikyan et al., 2016) • Implementation of the change (Avadikyan et al., 2016) • Usage of suppliers in change implementation (Ayala et al., 2019) • Change's connection to service strategy and its selection (Baines et al., 2010) • Effects on organizational culture (Kohtamäki et al., 2019) • Effect on organizational identity both internally and externally (Kohtamäki et al., 2019) • Short- and long-term effects of change |
| ANTECEDENTS AND OUTCOMES | <ul style="list-style-type: none"> • Different outcomes of digital servitization (Kohtamäki et al., 2020) • Sustainability from various aspects (De Jesus Pacheco et al., 2019; Díaz-Garrido et al., 2018) • Circular economy usage and obtaining it (De Jesus Pacheco et al., 2019; Díaz-Garrido et al., 2018) • Changes in the society caused by servitization (Díaz-Garrido et al., 2018) • Changes in firm boundaries (Kohtamäki et al., 2019) • Industry changes and reshaping (Kohtamäki et al., 2019) |

| | |
|--|---|
| | <ul style="list-style-type: none">• Environmental structures and strategic gatherings cause by servitization (Rabetino & Kohtamäki, 2018)• Further studies with interaction of servitization and theories of the firm (Kohtamäki et al., 2019)• Internet of Things; its inclusion and affects (Kohtamäki et al., 2019)• The future value creation and seizing (Kohtamäki et al., 2019)• Longer term effects on performance and capabilities (Valtakoski & Witell, 2018)• The way digitalization outlines the capability to involve further actors in the environment distributing advanced value to clients (Kohtamäki et al., 2019)• Connection with market maturity and commodity (Luoto et al., 2017)• Specifying which type of manufacturers gain from servitization (Luoto et al., 2017)• Risks experienced (Benedettini et al., 2015), and how to prevent and tackle those• Business model co-creation• Industry wide research to compare results of different companies in same settings |
|--|---|

6. CONCLUSION

6.1. Theoretical contributions

The theories used in this research provide opportunities to gain fresh insights of digital servitization and the change required for it. On top, different factors both inside of the organization and environmental factors affecting the change provide further insight on the change. Additionally, factors demonstrating how to facilitate the servitization change process can assist further research on the field and help companies in the servitization process to face potential risks better and make the process as efficient as possible. This research provides equally to servitization and digital servitization literature, on top of change management literature.

Servitization brings competitive advantage by establishing barriers for rivalry and third parties, generating dependency, bringing differentiation and novel innovations, on top of added market research and R&D. Servitization changes the competitive dynamics as the separation of conventional manufacturers and typical service firms is all the time more unclear. Firms have competition with novel and uncommon competitors, their own organization, clients and suppliers, further industries, and clans of industries and firms. (Vandermerwe & Rada, 1988.) On the other hand, digitalization of servitization can offer ways to advance competences and procedures for improved generation and seizing of value, to deliver more efficiently, amplify competence to customize efficiency, and to reorganize assets further efficient with the shift to novel commercial chances like novel markets, new smart solution, and new assignments. However, including innovative competences to organizational capabilities does not take away the requirement of manufacturing and engineering abilities. (Kohtamäki et al., 2019.)

Nevertheless, digital servitization implementation and connected business models, practices, and technologies also increase complication and generate challenges (Kohtamäki et al., 2019). The main challenges in the servitization change are how to mix the services to the general organizational strategies. Until now, services are not adequately combined to the strategic planning and competitive investigation. Though, there is an ongoing shift that varies

with the speed of the firm and the industry, observation requirements and threats, and if leading executives use reactive or proactive methods. (Vandermerwe & Rada, 1988.)

With the change to a digital servitization business model, companies have to reconsider the arrangements of their business model or models. For being able to do it, companies ought to comprehend the arrangements of additional companies in the same environment to generate strategic fit among the models considering factors like practices, value proposition, pricing, and technologies. As various possible actions alter based on technology and further competences of supplementary firms, implementation of strategies is restricted with cooperation alongside the additional players of the environment. Therefore, the emphasis of environments is vital to digital servitization. Additionally, the changes of value propositions, IT systems, organizational configurations, and business models in one company influence further companies in the environment. (Kohtamäki et al., 2019.)

The business model can be seen to containing the dimensions of customising (customised, standard, or flexible), way of pricing (based on agreement, product, outcome, or accessibility), and digitalization (regulating, optimising, monitoring, or self-directed). The mentioned dimensions lead to five business models: industrializer, product, outcome, integrated solution, and platform based providing. Organization can select among the business models of digital servitization and all may lead to benefits and improved performance of the firm. Therefore, the business model ought to be comprehended as an active notion, which is constantly created and recreated. To select the business model(s) executives are required to assess the different models based on the fit with their inner resources and environmental conditions. Thus, several of the aforementioned changes occur at the micro level as a company modifies its actions. (Kohtamäki et al., 2019.) Micro changes frequently form the macro environment since the micro actions composed create the macro ecosystem (Kohtamäki, Baines, Rabetino, & Bigdeli, 2018; Seidl & Whittington, 2014).

Nonetheless, to obtain lasting competitive advantage improved offerings with outcome orientation, customization, and independent features can be seen as most beneficial. It is especially crucial for firms to acknowledge in all the time further changing and competitive market settings that they need to test and work with several business models. Getting locked in with only one model even if it would be beneficial, may generate deep-seated inflexibility.

Hence, endlessly investigating business model improvements, like concluded from digitalization and servitization is vital for existence. (Kohtamäki et al., 2019.)

From business outlook, the beneficial servitization brings mutually value to customers and suppliers (Johnson, Christensen, and Kagermann 2008). From outlook of the supplier manufacturers gain beneficial income and options of offering differentiation compared to competitors (Oliva and Kallenberg 2003; Wise and Baumgartner 1999). Thus, the supplier value is connected to profits produced straight from sales expanding (Steiner et al. 2016) and obliquely across improved satisfaction and loyalty in the framework of the expenses and forgoes connected with servitization, such as resource necessities for service delivery (Fang, Palmatier, and Steenkamp 2008; Ulaga and Eggert 2006). From outlook of the customer, value signifies the fulfilment of advantages that the private customer or the customer company gains from the novel services, such as better manufacturing effectiveness as well as logistics gear and procedures, which encourage performance of operations (Ulaga and Reinartz 2011) and eventually lead to improvements in serving of clients (Anderson and Narus 1995; Payne, Storbacka, and Frow 2008). Additionally, service mix might signify a one-stop solutions for clients, thus, reducing search and recognition expenses (Visnjic, Wiengarten, and Neely 2016; Ye, Priem, and Alshwer 2012).

The transformation to service provider depends on the level of major modification, the obligation for organizational change, and the adjustments required for the transformation level desired. The interaction among service competences of supplier and customer are required during the change process, as they generate greater customer value and permit the supplier to seize value. Nonetheless, inside and outside fronting service competences, both on customer and supplier side, are not reflecting concepts but symbolize diverse ability areas, for example from customer side communication field implementation and from supplier side delivery, design and, manufacturing fields. However, no specific manner of designing and implementing the change is found successful in the research, as many factors affect to the process and several different actions can lead to success. Of course, the change to services is not always successful and the failure can be caused by various different factors. Therefore, the organizational capabilities, as well as, the network's capabilities should be researched to find the most suitable way for the given organization to provide services and to develop the missing resources required for the change and allocate existing resources in obligatory

manner. Additionally, it seems beneficial to plan ahead different ways of how to reverse failing servitization. (Forkmann, Henneberg, Witell, & Kindström, 2017.)

Services as inferior to products creates an absence of support contributing to lack of success in the service functions and hindering the foundation of a conclusive and beneficial service trade. Consequently, the change to offer services is not merely an issue of services offered, instead the entire organization must re-consider their focus. (Brax, 2005.) Quality is the stimulating aspect of services and unmistakably even free services' quality is likewise significant, as lack of success in services can influence also the product sales. Therefore, it could be recommended for manufacturers aiming for combined offering of products and services to follow strategy for service business. (Grönroos, 1990.)

Furthermore, commonly companies in the servitization process have difficulties to select between product activities' effectiveness and services' customization. Instead of selecting just one, companies ought to attain both as customization rises client value, whilst challenging distribution, which ought to be as effective as achievable. Another challenge of where to focus on is the fact that customization needs client focus whilst continuing with engineer mentality. However, for both of these selections managers ought to accept and grasp both solutions instead of selecting either one. Recognizing and handling with various paradoxes is essential to advance servitization implementation, luckily, various methods to cope exists and have been studied. These coping activities include strategy work, advanced programs, management systems, cross-boundary routines and boundaries, integration advancing, training, data contribution habits, integrated solutions modularization for excessive operation level of factories, and directing end-to-end functions. (Kohtamäki, Einola, & Rabetino, 2020.)

Regarding to the organizational intensity, outcomes of studies by Brax (2005) and Mathieu (2001) imply that opportunistic strategies prevent the improvement of a service connection. Various advanced properties for manufacturers to provide services exist; the evaluation structures ought to be changed to reinforce services and delivery and production practices are undividable. Furthermore, processes convert to be further visible for clients, although the emphasis is added on the procedures rather than the production. Additionally, the immateriality and procedure focus highlight various factors of trust and trustworthiness is

founded on previous performance. (Brax, 2005; de Brentani, 1991; Normann, 1991; Grönroos, 1990; Homburg and Garbe, 1999.)

Westergren and Jonsson (2004) established researching the barriers for services based on distant monitoring system that consumers are not necessarily continually observing offerings' value, which creates challenges for marketing and product design. The challenges with marketing lay in the manufacturers inner ability to advertise their service offerings and can be caused by absence of unity inside of the organization. Additionally, absence of information and complications suggest comparable issues for the servitization. (Westergren and Jonsson, 2004; Brax, 2005.) Thus, successful servitization obliges for sharp comprehension of the organization's strategic rationality, containing in what way servitization's economic aims are planned to be attained across the supportive procedures and united resources (Rabetino et al., 2017).

For companies better to react both on micro and macro levels, the measurement instruments need to be advanced to better monitor the change process to servitization inside the organization and in its environment. Furthermore, on macro level the consciousness of servitization especially amid community accountables and upsurge inducements of service inclusion is required. Also, the valuation of services in accounting and financial institutions should be increased. The flexibility and progression of developed economy can beneficially impact servitization. Even these economies are compound, multifaced and irregular, there is uncountable actual income development among companies that offer services beneficially. Thus, there can be substantial prospective equally in local and macro economies. However, companies seem to require most assistance with the changes in abilities, culture, financing, and agreements specific to offering services while constructing the technological innovation competences during the servitization process. (Baines & Shi, 2015.)

Additionally, there are various factors affecting the servitization from financial, customer, internal, and learning and growth perspectives. The main factors in financial perspective are cost structure, resource usage, creating long-term value and exploiting the opportunities for additional revenue, and customer value. From customer perspective various factors such as quality, price, availability, reliability, brand, and value co-creation are all influencing how customers experience the service offerings. Therefore, also different value propositions should be created for separate customer segments to reach contentment, acquisition, and

retain customers. From the internal perspective managing operations, customer, and innovation processes are all vital as the operations have short term effects, customers middle term, and innovations long term results. Furthermore, the learning and growth perspective is significant to gain intangible resources of organizational, human, and information capital. (Rabetino et al., 2017.)

Furthermore, servitization requires more actions from employees even though operational results inside the manufacturers hindered efficient delivery of services, as unwanted results are credited by persons instead of by system designs (Ross, 1977; Gebauer et al., 2004). Therefore, it can be seen that the incremental method is insufficient, as it is not changing the system designs, which have been developed to support manufacturing (Brax, 2005). Even though it has been seen that services could be easily copied, efficient structure and complicatedness of efforts suggest that profound engagement in the development of services is required. As a consequence, constructing structure for good quality services is not something that could be only founded on pointless service idea copying. Thus, manufacturers should not see services and their quality just as an expense but instead as value adding factors for both the company itself and its customers (Brax, 2005), even though the process and change required to obtain them might be difficult and time-consuming.

There are three principal groups of procedures for efficient servitization; innovation and co-production, relation management and co-creation, and seizure and efficiency of value. These can be reached through firstly establishing long-term relations with customers concluded from portfolio and relations management, and then assimilating corresponding and internally operated systems for services. Furthermore, inner relations, portfolio(s), distribution administration and captivating, converting client data to efficient services across supply chain, risks, delivery, and inner relation management actions all assist in the process. Additionally, matching and assimilating inner and exterior procedures across internal relation management and supply chain should be used to attain integration inside the organization and its network. (Rabetino et al., 2017.)

The factors assisting to facilitate digital servitization determined with this research are listed as a conclusion in the table below.

Table 4. Factors facilitating digital servitization.

| FACILITATING DIGITAL SERVITIZATION | |
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| <p><u>PLANNING AND ANALYSING</u></p> <ul style="list-style-type: none"> • Understanding the effects and possibilities of technology (Bonfanti et al., 2018; Dachs et al., 2014) • Finding the beneficial technologies and selecting the right ones for the change (Bonfanti et al., 2018; Dachs et al., 2014) • Including customers in the planning and manufacturing practices (Dachs et al., 2014) • Creating, developing, reconsidering, and reorganizing the business model(s) (Kohtamäki et al., 2019) • Realizing threats and potential failure (Vandermerwe & Rada, 1988; Forkmann, Henneberg, Witell, & Kindström, 2017) • Realizing that some service types, like demand chain services are riskier (Benedettini et al., 2015) • Analysing the current situation well both on micro and macro levels (Matschewsky et al., 2018) • Comprehending the setting and rivalry in the industry (Valtakoski & Witell, 2018) • Describing upcoming aims and goals (Matschewsky et al., 2018) • Strategic planning and rationality (Valtakoski & Witell, 2018; Rabetino et al., 2017) • Understanding and checking client demands continuously (Visnjic, Neely, & Jovanovic, 2018; Cui et al., 2019) • Planning when to start the process, services should be especially included in good economic situation as more success of services starting with economic stability (Böhm, Eggert, & Thiesbrummel, 2017; Itami & Roehl, 1987) • Keeping in mind that financial stability is not an essential obligation for positive service changeover (Cyert & March, 1963; Greve, 2003) • Planning and implementing inducements and objects targeted correspondingly (Kanninen et al., 2017) • Being and remaining innovative (Kindström et al., 2015) | <p><u>MANAGEMENT</u></p> <ul style="list-style-type: none"> • Willingness to reformulate the business model(s) (Avadikyan et al., 2016) • Adapting the business for the change to improve resources required to reach benefits (Baines & Shi, 2015) • Strategic agility for developing new business models and for adapting to change (Weber & Tarba, 2014; Swafford, Ghosh, & Murthy, 2006) • Obtaining organizational commitment (Selvarajan et al., 2007; Wiener 1982) • Concentrating to change mindset and culture of the organization to service orientation (Grönroos, 2006; Normann, 2001; Kowalkowski et al., 2017) • Creating orientation and mindset of fixed culture of product-services (Martinez et al., 2010) • Recognizing the potential opportunities (Avadikyan et al., 2016) • Obtaining managerial commitment to have commitment in rest of the organization (Kanninen et al., 2017) • Realising that management and managerial capabilities are crucial (Crowley et al., 2018) • Using prospective methods and techniques (Vandermerwe & Rada, 1988) • Planning and implementing organizational configurations and reorganization (Kohtamäki et al., 2019; Forkmann et al., 2017) • Applying data gathering documentation for the implementation (Avadikyan et al., 2016) • Using directorial approaches and methods that might not be upfront (Benedettini et al., 2015) • Managing the inner disputes of organizing the service strategy effortlessly and rapidly (Benedettini et al., 2015) • Having executives capable to manage the related results of the threats (Benedettini et al., 2015) • Paying special attention to possibilities of training services and consulting (Avadikyan et al., 2016) • Gaining improved grip of the business reasoning required (Kindström et al., 2015) |

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| <ul style="list-style-type: none"> •Developing diverse scenarios of service delivery (Sundin et al., 2015) •Considering sustainability and using circular economy (de Jesus Pacheco et al., 2019; Szász & Seer, 2018) •Outlining diverse pricing models for distinctive services and client segments (Kohtamäki et al., 2019) •Using the effectual logic (Cui et al., 2019) •Experimenting to analyse and test ideas (Beltagui & Santini, 2019; Cui et al., 2019) •Assessing potential risks frequently (Cui et al., 2019) •Positioning of products and services (Cassia et al., 2015) | <ul style="list-style-type: none"> •Implementing added problem-solving methods (Kindström et al., 2015) •Highlighting inner effectiveness (Valtakoski & Witell, 2018) •Being and staying as a front-runner (Kanninen et al., 2017) •Creating and developing knowledge (Sklyar et al., 2019) •Reformatting organizational structures (Brax, 2005) •Rationally acknowledging and concentrating on the decision for servitization (Crowley et al., 2018) •Adding managerial training and potentially hire new managers (Crowley et al., 2018) •Discussing about best procedures and tactics to attain united servitization (Crowley et al., 2018) •Creating trust (Brax, 2005; de Brentani, 1991; Normann, 1991; Grönroos, 1990; Homburg & Garbe, 1999) •Reducing tensions across the processes; gently phased tactic appears to be best suited for it (Crowley et al., 2018) •Focusing on operations, customer, and innovation management processes (Rabetino et al., 2017) |
| <p><u>VALUE CREATION</u></p> <ul style="list-style-type: none"> •Comprehending the multidimensional worth obtainable throughout delivering lifecycle focused product service systems (Meier, Roy & Seliger, 2010; Tukker, 2015) •Understanding client operations and value creation (Baines & Lightfoot 2013; Ulaga & Reinartz 2011) •Using provider value approach (Matschewsky et al., 2018) •Evaluating present offerings for planning improved methods and offerings (Matschewsky et al., 2018) •Comprehending the most vital alterations among offering products and delivering services (Matschewsky et al., 2018) •Obtaining client focus and understanding the value created by that (Kindström et al., 2015) •Co-creating value with customers (Rabetino et al., 2017) •Reconfiguring the information channels (Bustinza et al., 2013) •Providing services with high quality personnel (Cui et al., 2019) •Aiming to improve service satisfaction rate (Chalal et al., 2015) •Creating brand image (Cassia, Cobelli, & Ugolini, 2017) | <p><u>CAPABILITIES AND RESOURCES</u></p> <ul style="list-style-type: none"> •Attaining universal set of different vital variables, capabilities and resources (Bustinza et al., 2018) •Adjusting the variables with strategic objectives (Boxall, 1996; Junni, Sarala, Taras, & Tarba, 2013; Zhou, Hong, & Liu, 2013) •Understanding that required capabilities are rarely found directly (Visnjic, Neely, & Jovanovic, 2018) •Developing novel capabilities and skills for the services (Visnjic, Neely, & Jovanovic, 2018) •Obtaining especially client focus capability (Visnjic, Neely, & Jovanovic, 2018) •Selecting to which capabilities to invest (Valtakoski & Witell, 2018) •Obtaining, creating and maintaining intangible dynamic capabilities and resources (Delmar & Shane, 2003; Rabetino et al., 2017) •Having intangible resources for integrated solutions that are reinforced by the organizations improved structure of product-service processes (Bustinza et al., 2018) •Developing marketing and interaction capabilities (Kanninen et al., 2017) •Improving the capabilities of front and back office (Valtakoski & Witell, 2018) •Establishing technology and IT tools and support systems (Kanninen et al., 2017) |

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| <ul style="list-style-type: none"> •Obtaining customer loyalty (Cassia, Cobelli, & Ugolini, 2017) •Using and advantaging from CRM tools (Kunz & Hogreve, 2011) •Understanding and concentrating on service recovery and criticism treatment (Robertson & Shaw, 2009; Kunz & Hogreve, 2011) •Focusing to create long-term shareholder value (Brax, 2005) | <ul style="list-style-type: none"> •Concentrating on added features besides technological ones in services (Kindström et al., 2015) •Focusing on competencies and agility of the organization (Buyukozkan, Feyzioglu, & Nebol, 2008) •Utilizing HR systems (Baik, Kim, & Patel, 2019) •Creating a novel type of position, combining manufacturing/ back office and service/ front office to obtain greater resource allocation resilience (Chalal et al., 2015) •Introducing a new training plan to rapidly increase total multiskilled capabilities (Chalal et al., 2015; Kohtamäki, Einola, & Rabetino, 2020) •Restructuring final-product warehouse and a novel stock managing strategy resulting in improved safety of inventory levels (Chalal et al., 2015) •Considering organizational, human and information capitals (Rabetino et al., 2017) •Obtaining right kind of and trained sales personnel (Ulaga & Loveland, 2014; Kindström et al., 2015) |
| <p><u>MONITORING</u></p> <ul style="list-style-type: none"> •Recording improvement in lifecycle of product and service factors (Matschewsky et al., 2018) •Trying to decrease the emphasis on economic worth and primary fees of services (Matschewsky et al., 2018) •Enabling assortment of wider, product-service and provider oriented KPIs that can be used during the planning phase (Matschewsky et al., 2018) •Creating sustainable performance improvements (Szász & Seer, 2018) •Continuous measuring and monitoring in different ways (Reim et al., 2018; Baines & Shi, 2015) •Using performance monitoring systems and target measurement (e.g service profit level divided by total profits) (Baik, Kim, & Patel, 2019; Reim et al., 2018; Fang et al., 2008) •Sharing instruments for clients with monitoring and contracts (Reim et al., 2018) •Assessing and mapping risks (Reim et al., 2018) | <p><u>NETWORK AND STAKEHOLDERS</u></p> <ul style="list-style-type: none"> •Enlarging the network (Dachs et al., 2014) •Uniting strengths to deliver diverse experience and abilities (Parida & Wincent, 2019) •Concentrating on buyer-supplier relations (Bast et al., 2012) •Using different networks and stakeholders and strengthening relations with the ones in use (Parida & Wincent, 2019; Cui et al., 2019; Andrews et al., 2018) •Focusing on supply chain (Cui et al., 2019; Rabetino et al., 2017) •Thinking about novel forms of ecosystems (Sklyar et al., 2019; Parida & Wincent, 2019; Beltagui & Santini, 2019) •Considering strategic alliances / service triads (Gomes et al., 2011; Beltagui & Santini, 2019) •Using contractors in supportive functions and including them in the selection of strategies for solution offers (Ayala et al., 2019) •Potentially assigning implementation of services to suppliers if needed (Ayala et al., 2019; Sklyar et al., 2019) •Understanding and complaining stakeholders to effect aspect containing intention, willingness, awareness, and trust (Malle & Knobe, 1997) •Communicating transparently (Crowley et al., 2018) |

All in all, the extensive investments required for digital servitization oblige for substantial growth of value creation and seizure to generate the desired revenues. The implementation of digitalization necessitates assets for additional capabilities. As an example, providing assets to value chain digitalization is recognised to alter capabilities and practises of the entire organization throughout supply chain, sales, delivery, backing functions like HR and finance, and R&D. There are various different micro and macro level factors listed in this research that need to be acknowledged and taken into consideration as they all may affect the servitization change process in different ways. Additionally, to facilitate the digital servitization change process attention needs to be paid to value creation, planning and analysing, management, capabilities and resources, monitoring, and network and stakeholders. All these factors should be considered also from managerial perspective in the beginning and during the digital servitization change process.

6.2. Limitations

Fundamentally every research has its limitations, so does this research as well. This research was completed as a systematic literature review meaning that any empirical study or further research on the matter was not conducted. Furthermore, the article collection of this literature review was guided through a specific keyword search, which could have left out some potentially relevant articles using different type of terminology. The limitation of the review itself was that some articles of the review did not provide useful information even though they were found with the keywords used in the search. Additionally, some of the articles and studies included in this literature review were conducted as case studies, which poses a question, how generalizable their results are when taken to another context as the results are based on merely the interpretation of the researcher.

Moreover, servitization research would advantage from further empirical research and analysis of the micro and macro factors affecting the digital servitization change process and how to facilitate the change. Indicating that this is potential course of empirical research calling for important further development of the theory and conceptualization. Furthermore, the procedures and capabilities affecting the change and facilitating it call for additional research to develop a further detailed comprehension.

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