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From component manufacturer to service provider

Case: Company X

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ABBREVIATIONS

B2B	Business-to-business
CBM	Condition-based Maintenance
CMMS	Computerized maintenance management system
ERP	Enterprise Resource Planning
G-D logic	Goods-dominant logic
IB	Installed base service market
IoT	Internet of Things
IT	Information Technology
KPI	Key Performance Indicator
MM	Maintenance Management
MPM	Maintenance Performance Measurement
OEE	Overall Equipment Effectiveness
PM	Preventive Maintenance
PSS	Product-service System
RCM	Reliability Centered Maintenance
ROE	Return On Equity
SAP	Systeme, Anwendungen und Produkte in der Datenverarbeitung
SBU	Strategic Business Unit
S-D logic	Service-dominant logic
TPM	Total Productive Maintenance

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ABSTRACT:
This research identifies the best practices of servitization process (e.g. transition stages, change process, overcoming challenges and achieved benefits) and provides useful information on optimisation and creation of the maintenance service offering. The research is provided as an assignment for a case company operating in civil defence shelter industry which aims to expand its business from component manufacturer to a service provider.

The study is entirely qualitative. The first research question examines what has to be changed inside the case company so that maintenance services can be provided to the customers. This is studied through a literature review of existing servitization theories and theme interviews with experts from three Finnish industrial companies. The second research question examines how to make the customers interested in the case company's services. This is approached with structured questionnaires which are sent to three different customer segments: 1) potential residential building customers and property managers, 2) construction companies and end users, and 3) the existing customers.

According to the findings of this research, the case company should take into close consideration the following entities when setting up the maintenance service business: 1) defining a service strategy, 2) building organisational structure, 3) transforming organisational culture, 4) creating optimal service offering, 5) managing service knowledge and communication, and 6) pursued benefits and possible success factors.

Based on the results of the semi-structured interviews, potential new customers must be made aware of the need of civil shelter maintenance services and the case company should offer services which include 1) inspection of the current state of civil shelter, 2) individual inspections and repairs, 3) leak tests and maintenance activities, and 4) maintenance contracts and training. Lastly, it is found that the case company should consider different options when selling maintenance services to the customers, such as face-to-face type of sale, collaboration with different business partners and/or offering the services as part of larger service packages.

KEY WORDS: Servitization, Maintenance Service, Service Strategy, Organisational Structure, Organisational Culture, Service Knowledge and Communication.

1. INTRODUCTION

1.1. Background

The aim of this research is to identify best practices of servitization process and useful information of optimising service offering for a Finnish civil protection company specialising in civil defence solutions (hereinafter referred to as the "case company"), which aims to expand its business from a component manufacturing to a service provider. The case-company has been a civil defence solutions component manufacturer throughout its history and has offered maintenance service only to a small extent to its customers. The demand for the maintenance service has increased and a few years ago the rescue authorities from the Ministry of the Interior have been in contact with the case company due to the condition and maintenance of the shelters in Finland.

A civil defence shelter is a space in a building the purpose of which is to protect people from explosions during a war. The construction of the civil defence shelters was started in Finland in the 1950s, before the Winter War. Today, there are shelters for almost 4 million people around the country. Most of the shelters are located in the major cities, former conservation sites and least in the countryside. In Finland, the construction of the civil defence shelters is statutory, Rescue Act (379/2011) provides more detailed information on the construction and maintenance of civil defence shelters. The law specifies that a civil defence shelter must be constructed if a new residential building has a floor area larger than 1200 square meters. In addition, the law requires that in the normal use the shelter structure must be kept undamaged and in a working order, and the shelter should be ready to operate within 72 hours from the announcement of the authorities.

The inspection and maintenance of the shelters was the responsibility of the authorities under the Ministry of the Interior until 2011. The Rescue Act was changed in 2011, and the responsibility of the condition and maintenance of civil defence shelters was transferred to their owner or selected holder. (The Finnish National Rescue Association 2018.) According to the experience of the case company’s maintenance manager, this change may not be comprehensively understood by all shelter owners or holders. Based on his

experience, in many buildings, the shelters are forgotten, used as a storage room or left in the original condition. This suggests that not all the Finnish civil defence shelters are necessarily capable to operate at the moment.

By virtue of the law, a care taker must be appointed for each shelter and his/her contact information and obligations must be included in the property's rescue plan. The case company's service manager often encounters a situation where the responsibility of a shelter's condition and maintenance is included in the property's general maintenance agreement with an external service provider. However, these service providers do not often have the required special skills or equipment for shelter service. If a civil protection shelter is not maintained according to the maintenance plan and periodic inspections are not performed in time, it is quite possible that the civil protection shelter does not meet the legal requirements. Hence, there is a clear need for a shelter maintenance service that the relevant market has just not yet fully identified.

In the technology industry the growth potential is in services. Companies are looking for new service concepts and emphasise the change from product-based operations to solution providers and even to customers' value partners. The aim is to grow profitably with the help of the new service business. However, it has been proven that the strategic shift from a manufacturing company to a service organisation is often a more complicated change process than expected. In a service organisation, half of the turnover may come from the service business. However, the entire organisation must be united to achieve it. Change is the major challenge for the technology industry companies aiming to service business. (Grönroos et al. 2007: 8–9.)

In global competition, it has become more and more difficult to distinguish with simple technical solutions. Companies can provide a limited number of competitive advantages that can be pursued by increasing product development efforts and improving technical solutions. For product-oriented companies, this is a dilemma. The companies should invest more than before to product development while at the same time the products face increasing competitive pressure. Alongside to a product-oriented model, it is necessary to develop service activities that enable the growth of business in new areas. Developing

new service packages for customers requires more solid network collaboration than before. The question is whether technology companies can adopt value-based thinking fast enough and transform themselves into service-oriented organisations. (Grönroos et al. 2007: 8–9.)

1.2. Research questions and scope

The aim of this study is to identify and suggest the best practices of servitization process towards the role of a service provider (e.g. useful information for the case company of the required internal processes and activities, transition stages, challenges and benefits) and advise in optimising the maintenance service offering that can be provided to the customers. This is done by answering the following two research questions.

1. What has to be changed inside the case company (e.g. processes, staff etc.) so that maintenance services can be provided to the customers?
2. How to make the customers interested to purchase maintenance services from the case company?

The aim of this thesis is to create overall understanding at the company level of the transformation process called ‘servitization’ consisting of different transition stages from a component manufacturer to a service provider. The thesis examines the main components of servitization and the interrelations between them as well as servitization’s benefits and challenges. For the sake of manageability of the whole, the analysis excludes very specific details. The review of the work is limited to manufacturers who provide industrial products and services only.

The definition of the industrial services is broad. This thesis focuses on factors which are relevant to maintenance such as development of maintenance services, types, impact to company finance, management and measurement. In addition, the thesis takes into consideration especially component manufacturers who operate in developed markets and

are looking for growth through maintenance services. This thesis focuses on the component manufacturer (service provider) point of view and the analysis is not concluded from the customer (service buyer) point of view.

1.3. Methodology, data collection and implementation of research

The study is entirely qualitative. The first research question is studied through literature review of existing theories and theme interviews with experts from three Finnish industrial companies, which have successfully expanded to service business. The purpose of qualitative metasynthesis is to combine theories and studies that examine the same subject. The key metaphors, phrases, ideas and concepts are highlighted from selected theories. The most important theories are compared with each other and compacted to smaller parts by grouping. This comparison aims to create classifications and to find unity and differences in the results of the studies. Finally, the comprehensive picture of the subject area is created, which can be used in this research. (Walsh & Downe 2005: 204–205, 208–209.)

The theme interview is a semi-structured interview method, which can be qualitative or quantitative. In a semi-structured interview, the topic is known in advance and it focuses on the interviewee's subjective experiences. The aim is to raise the voice of the examinees and to explore the individual thoughts, feelings, experiences and non-verbal experience. (Hirsijärvi & Hurme 2008: 47–48.)

The second research question is approached by questionnaires that were sent to potential customers. The structured interview is a formatted interview form in which the respondents follow the questionnaire's instructions. The questionnaire form used in the interview presents questions with different answer options. All the interviewees are asked the same questions in the same order and the interviewees choose the most appropriate option. (Eskola & Suoranta 2008: 86.) The objectives of the questionnaires are to identify and understand the needs of the potential customers in the civil shelter and maintenance business; the aim is to examine the customers' interest in maintenance and modernisation as well as their preferences and requirements regarding the service.

Smaller sample sizes are suitable for qualitative research as long as the interviewees are appropriately selected. In qualitative research, it is important that the interviewees have wide knowledge and experience about the studied phenomenon. Therefore, the choice of interviewees should be carefully considered and suitable for the purpose. (Hirsijärvi & Hurme 2008: 48.)

The data for the first research question is gathered through semi-structured interviews. The interviewed companies and their representatives were carefully selected. It is important that the business operations of the companies correspond as well as possible to the business of the case company. All selected companies are Finnish listed companies that are pioneers in their own industry, succeeded in their service business and well known worldwide. However, the equipment the companies produce are in constant use and are so-called critical products in their customers' processes, which makes their maintenance particularly important. The equipment manufactured by the companies differs significantly in this respect from that of the case company. Company representatives are highly educated people in top management positions and have extensive experience in various business functions in the service business. It can be said that the interviewees are experts in their field with long experience. The companies wanted to answer the questions anonymously. The theme interview included six broad questions that included more specific sub-questions (see Annex 1). All the questions were based on the theoretical part of the thesis. The interview questions were sent to the interviewees by e-mail about 1–2 weeks before the interview took place so that they could prepare for it. Finally, on the basis of the literature review and the theme interviews best practices are identified and compiled as guidelines and recommendations for the development of the case company's service business.

The data for the second research question is collected through structured interviews (hereinafter surveys). The surveys were designed to suit the case company's customers. The questions were based on the theory of this thesis and the knowledge and experience of the case company's experts in service field. The surveys were specified for different customer segments: 1) potential residential building customers and property managers (see Annex 2), 2) construction companies and end users (see Annex 3), and 3) the existing

customers (see Annex 4). The surveys were built with a help of Microsoft Office 365 Forms tool and e-lomake service. The surveys were sent to the customers by e-mail and shared in different social media groups. Finally, on the basis of the literature review and the findings of the surveys, best practices are identified and compiled as guidelines and recommendations for the development of the case company's service offering.

1.4. Research structure

The study begins with the general presentation of the case company and the description of the company's current civil shelter and maintenance business. Next, the civil shelter industry as well as the statutory requirements for shelter inspections and maintenance are described in general. After this the study continues with the theoretical review of the research topic which is divided into three sub-areas: 1) industrial manufacturers in a changing business environment, 2) servitization as a process of transformation, 3) challenges associated with servitization. Chapters 3–5 approach the first and second research question by studying where the industrial service business researches have so far focused on and what kind of best practices can be identified on the basis of the literature. Chapter six presents the findings of the study. The final chapter deals with the theoretical contribution, main findings, limitations and possible implications for further research. Structure of this thesis is presented in Figure 1.

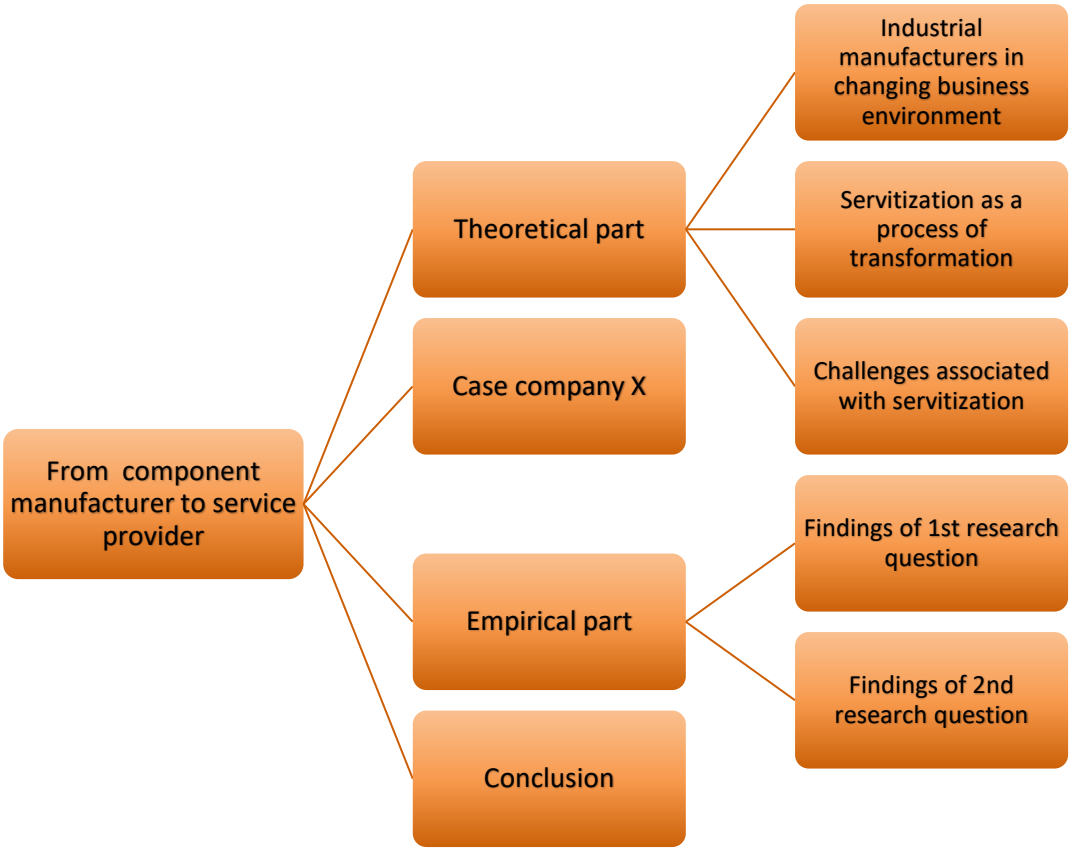

Figure 1. Structure of the research.

2. CASE COMPANY X

2.1. Introduction of case company X

For the reasons of confidentiality the case company's name remains anonymous. Case company X is a Finnish-based company which become part of bigger group in 2017. Case company X is an international pioneer in applying security solutions and its special areas of expertise are pressure protection, filtration and ventilation technology, and comprehensive security technology applications. It is specialised in blast protection and special ventilation technology that is utilised in defensive constructions such as hardened military facilities, civil shelters and in the petrochemical and chemical industry. The company operates in both domestic and export market. In the domestic market the company has a few competitors while in the export market there is more competition. However, some of the foreign competitors only compete with the case company X in industrial applications.

The company X's history begins in 1953 when two young men wanted to become entrepreneurs, in the same year the case company X was established in Helsinki. Their business started with equipment manufacturing for school gymnastics in a small basement called Junk Pit. In October 1958, a new law on Civil Defence which regulated the building of civil defence shelters was accepted in the Parliament. Case company X recognised the opportunity and participated as a shelter equipment provider and supplier right from the start. The company's sales of civil defence products continued to grow while the share of the other product groups decreased and became more competitive. Case company X entirely specialised in civil defence equipment manufacturing and gained domestic market leader position by the year 1963.

In the beginning of 1970's the road to international markets was launched thanks to the case company's expertise in blast protection, continuous product development and advanced technology. International business begun with the Swedish market and continued to United States, South-East Asia and Middle East. The sister company in the United States was also established in the beginning of 1980s. The Middle East was the main

export area for the case company at the turn of the 1980s and 1990s. The business was conducted in Saudi Arabia, Qatar, Iraq, Libya and Kuwait. In Kuwait, civil defence shelters were also built in addition to military sites which the authorities began to promote in their construction. Nowadays half of the case company's turnover comes from export with deliveries to over 25 countries around the world.

2.2. Civil defence shelter system and shelters statutory requirements for inspections and maintenance

The section 20 of the Finnish Ministry of the Interior Decree on the Technical Requirements for Civil Defence Shelters and their Equipment Maintenance (506/2011) passed in 2011 requires that the equipment should be in good working order and that equipment should be inspected and serviced at least every 10 years. However, it is also advisable to follow the manufacturer's recommendations for shorter maintenance intervals. (The Ministry of Interior 2011.)

Previously the Finnish rescue authorities themselves carried out the civil protection inspections every 10 years alongside with fire inspections. In the 2011 Decree the fire control became a discretionary task based on a risk survey and thus the authority-driven systematic inspecting of civil defences disappeared. The major reason for the change was that the rescue authorities did not have enough resources to carry out all inspections. However, as explained in the chapter 1.1., by the virtue of the 2011 Decree the inspection of civil defence shelters shall be carried out by appropriately trained persons or a special service company engaged by the shelter owner or holder. The law also contains a requirement to prepare and maintain an inspection report where the inspections conducted shall be reported. The report shall be made available upon request of the rescue authority. (The Ministry of Interior 2011.)

The Decree also specifies certain equipment that shall be available in the shelter. In addition to the equipment dictated by the Decree also certain additional equipment shall be kept available in the civil protection system, but an adjustment at the decree level is not

expedient. However, for example, Finnish Organisation for Rescue Services provides advice and guidelines on this equipment. (The Ministry of Interior 2011.)

Finland's current civil defence shelter system

Tuominen (2017) examined in her master thesis (University of Tampere/Health Sciences) Finland's preparedness for civil defence sheltering in emergency conditions. The overall conclusion of Tuominen's (2017) study was that the preparedness for the use of civil defences varies by region depending on the activeness of the local rescue departments, municipalities and self-preparedness actors (the shelter owners/holders). The use of civil protection has not been effectively guided or controlled in the 2000s, although the legislation obliges different actors to be prepared. Based on the results of Tuominen's study "*Finland should invest in sheltering system preparedness planning and create national guidelines to increase consistency in preparedness levels in order to ensure the maximum protective impact of the shelter system in emergency conditions*".

According to Tuominen (2017: 82) there are differences in how the number and condition of civil defence shelters are monitored by the rescue authorities. There is also a lack of nationwide reliable information on the number of civil defence shelters or at least the coverage of the information is questionable. Tuominen (2017) suggests that an effective cooperation with the Defence Forces and private maintenance companies could be utilised to assess the available resources for population protection and the impact of evacuation and human movement such as military service or work duties which affect the release or additional need for shelters. At the same time, the regional administrations and rescue departments would have the opportunity to create a control system that effectively monitors regional civil protection and emergency preparedness planning.

Tuominen (2017: 84) continued that up-to-date information on the condition of civil defence shelters is also helpful in designing the human and material resources that are needed to protect the population. The rescue departments' responses showed a great dispersion in the estimation on how quickly the rescue departments in different rescue areas can put shelters into operation, which may tell us about the unevenness of control (i.e.

concrete differences in condition), but also that the rescue departments do not have realistic nationally consistent information on the resources needed to support the deployment and use of civil defence shelters. In addition, knowledge of the condition of civil protection is important information for assessing national security of supply. If there is a large number of shelters that require spare parts or filters at one time in a crisis this should be taken into account when designing security of supply. The responses from the municipalities and self-preparedness actors indicated that fixed-term fire inspections play an important role in complying with self-preparedness obligations. Despite this, the supervision, legislation and guidance have been relaxed in this respect and civil protection control is currently left to a great extent to the emergency services themselves. The research shows, there is a risk that without national control policies and early intervention, regional disparities in terms of effective population protection will continue to increase.

One of the legal issues raised in Tuominen's (2017: 84–58) study were the confusing responsibilities between different actors. For example, the current state of shelter maintenance illustrates the unclear relationship between self-preparedness (on the responsibility of shelter owner and holders) and the management and monitoring responsibilities of the public rescue departments: the rescue departments can justify their own lack of responsibility through self-preparedness legislation, and the interface is not clear. According to Tuominen (2017: 84–85), it would be useful to specify the relationship between the self-preparedness responsibilities provided by the law and the management responsibility of the rescue departments.

2.3. Current maintenance business in case company X

As mentioned in the previous chapters, the responsibility for inspections and maintenance of the shelters in Finland was transferred to the shelter owners and selected holders in accordance to the Rescue Act (379/2011) in 2011. However, this change may not be comprehensively understood by those parties, which may have led to shortcomings in the shelter functionality. The case company has identified this issue a long time ago but has not seen a need to consider maintenance services before due to its exceptionally powerful

market position in the new equipment business. Reportedly, the company's previous management had considered maintenance service as an "unprofitable necessity" and stated that "we sell only new devices". However, thanks to the technology and market developments, the new management has a different attitude towards service business. They have understood that if civil protection shelters are not continuously maintained and periodic inspections carried out in time, it is quite possible that the civil protection shelters do not meet the legal requirements. Instead of just selling new products and solutions to replace the old ones, the current management has recognised a clear need for the maintenance service that the relevant market itself has just not yet fully identified.

Nowadays there are more than 55,000 civil defence shelters in Finland, and more are built every year. Based on the case company's estimation, about 25,000 of the existing shelters are old shelters with a possibility of deficiencies and functionality issues. The case company has a long history of delivering civil defence shelters and components. However, the maintenance service has been provided only to a limited extent, mostly only in a form of commissioning inspections and replacement component deliveries. However, now the company's aim is to create a service business that will grow and balance current equipment-based business.

The maintenance service market is significant in Finland and in the other Nordic countries. Typically, government regulations are not fully observed and/or complied. For example, 10-year test runs, and inspections have not been carried out in many real estates. The case company's assumption is that civil defence shelters are generally 'not in the required condition' and not enough attention has been paid to this issue, which has led to the failure of the maintenance of civil defence shelters and to a repair debt. The case company's customers are the owners of civil defence shelter buildings such as public real estate, military property, private parking garages and private properties. The market can be divided into two customer segments: 1) housing company owned real estate and 2) demanding population protection.

According to the case company, maintenance and servicing of civil defence shelters brings the customer the following benefits: carelessness, capability, performance, predictability and budgeting accuracy, cost savings, training, usability, know-how, company expertise and information and up-to-date picture. The case company also estimates that the customers would receive the following competitive advantages when ordering maintenance services from them: complete solutions instead of sole component deliveries, expertise and know-how, equipment knowledge and cost efficiency, fast and short supply chain (as the case company is the only supplier of spare parts), quality (since the case company is the only air filter manufacturer in Finland and possesses a long history of building civil defence shelters) and huge documentation of delivered projects.

3. INDUSTRIAL MANUFACTURERS IN CHANGING BUSINESS ENVIRONMENT

The business environment of industrial equipment suppliers is influenced by the combination of several economic and rapidly changing dynamic trends which has facilitated companies to merge and also to concentrate on the international level. Businesses are driven by technology, business innovations, customer needs, various regulations and limitations, or combinations of all the previous. All these factors and trends increase the complexity of solution development and the importance and challenge of introducing new products and services. (Salkari et al. 2007: 5.)

As products are increasingly becoming a mass commodity, many manufacturers face the question: how do we improve our profit margins? One answer is to move down in the supplier chain and to tie the product with a service to form a comprehensive integrated solution. In other words, the pressure on profit margins, increased competition, and changing customer needs have together with other factors contributed to the growth of industrial services. (Ojasalo 2008: 17–20.)

The interest in exploiting external services provided by service companies is increasing while manufacturers focus more on their core business (Gebauer et al. 2006: 374; 2008b: 387–388; Kumar et al. 2006: 106). Today, the trend is that more and more services are being purchased from the service supply network (Riis et al. 2007: 935–936). Networking requirements are also increased by globalisation, the complexity of technological innovations and the demand for integrated solutions. Manufacturers often have access to the extensive installation database which provides companies important information on providing services. Information gathered from the field can facilitate the management, development and implementation of the services. All these aspects, however, require the development of new features. (Ahonen et al. 2010: 11.)

Industrial companies are therefore undergoing change from a traditional equipment supplier to their new role as a provider of customer value and product-based value-added services. However, the change has often been found to be very difficult to implement.

Some industrial services have been partially implemented as technological solutions, but they are often seen as experimental plans. Industrial companies' main challenge has been identification of customer critical processes and development of applicable services to support these processes. (Salkari et al. 2007: 5.)

In northern Europe, the interest of industrial companies in the field of service innovation is high. Especially companies in industrial sector consider service business more profitable and faster growing than the traditional product business. In some instances, it has become apparent that during the recession the service business is more profitable than the product business. Many companies in the field have succeeded very well in moving towards to the service business and thus inspired others. (Korhonen et al. 2011: 480.) Deloitte (2006: 1) benchmarking study presented that the average of service revenues of the total business of manufacturing companies was more than 25 % already in 2006. Recognised companies in the service business such as Rolls-Royce plc and Xerox Corporation have managed to increase the service business's share up to 50 % or more of the company's incomes. The service business's average profitability was over 75 % higher than the profitability of the entire business unit, which makes it particularly important for manufacturers. Deloitte (2006: 1.)

The change is also noticeable from customers' point of view: the role of supporting services is becoming more important to achieve the maximum performance of industrial products. Customers are increasingly demanding 'turnkey' type of solutions to their problems and they are increasingly dependent on service providers to maintain a sufficient level of performance in the eyes of stakeholders, and in terms of market requirements. (Kumar et al. 2006: 106.) Nowadays, product manufacturers are looking for more profitable business opportunities in the service sector from customer requirements to services, protection from financial fluctuations, and to succeed with growth (Ahonen et al. 2010: 11). This means that companies must change their business towards service-dominant logic, which seems to be the current trend in the industry (Vargo & Lusch 2004; Lusch et al. 2010).

3.1. Differences between goods and services

The terms product and service are essentially related to discussion about servitization. According to Goedkoop (1999: 17), product can be defined as tangible asset for sale and simply able to "fall on your toe". The products (hereinafter goods) are characterised by a material artefact such as car or airplane in the manufacturing world. On the other hand, "service" is more contentious and often mistakenly defined as product which it is not (Baines et al. 2009: 496). In this thesis, the word "service" refers to an offering such as maintenance, insurance and renovation.

Based on the early service marketing scholars, the comparison between material goods and the specific features of services are characterised by the following four dimensions (also known as "IHIP" characteristics): 1) inseparability of production and consumption, 2) heterogeneity, 3) inventoriability and 4) perishability (Anderson et al. 1997: 136; Lovelock & Gummesson 2004: 20; Grönroos 2006: 319; Moeller 2010: 359). However, there is still no common definition identified in the literature for service. The Nordic School defines services as "*process that consists of a set of activities which take place in interactions between a customer and people, goods and other physical resources, systems and/or infrastructures representing the service provider and possibly involving other customers, which aim at solving customers' problems*" (Grönroos 2000: 46; 2006: 323).

Vargo and Lusch (2008: 255) defined *goods* as tangible output embedded with value which focus on economic exchange, *service* as process of doing something for another party (goods and service together called by goods-dominant G-D logic) and *services* as restricted type of intangible good or add-on which is considered to enhance the value of the good (called by service-dominant S-D logic). Service can be defined also as a process that partially results simultaneous and unique production and consumption processes (Grönroos, 2001; 2006: 319). However, services are co-produced with customers due its experience of nature which makes the development process situation specific and unique (Nijssen et al. 2006: 242). Therefore, services are most of the time cases between individuals even in the manufacturing environment (Turunen 2013: 13).

According to Vargo and Lusch (2008: 254), there are two logics for transitioning from goods to service(s). First is based on G-D logic (goods-dominant) where services are a special type of good and second is S-D logic (service-dominant) where service is considered as service instead of a good (a unit of output). In the goods logic, the company provides goods as resources for customers and their processes in a value creating way, on the other hand, services are value supporting processes where company resources interact with customers in a way that value is created in the customers processes (Grönroos, 2006: 324). Vargo and Lusch (2008: 258) claimed that S-D logic characterises the meeting point of business and service marketing since both were created due to the inadequacies of traditional marketing which is based on G-D logic. Table 1 presents seven differences between the goods- and service-centered dominant logic which illustrate the transitional shift from a good to service focus.

Attribute	Good logic	Service logic
Primary unit of exchange	"People exchange for goods (also known as operand resources)"	"People exchange to acquire the benefits of specialized competences (knowledge and skills, also known as operant services) and services"
Role of goods	"Providing goods or services"	"Assisting customers with their value-creation processes"
Meaning of value	"Producing value"	"Co-creating value"
Role of customer	"Customers conidered as isolated entities and targets"	"Customers considered as resources"
Company-customer interaction	"Firm resources primarily as operand (such as natural resources)"	"Firm resources primarily as operant (such as knowledge and skills)"
Source of economic growth	"Wealth is obtained from surplus tangible resources and good (operand resources)"	" Wealth is obtained through the application and exchange of specialized knowledge and skills (operant resources)"
Efficiency	"Making efficiency primary"	"Increasing efficiency through effectiveness"

Table 1. Transitional shift from a good to service focus (Adapted from Vargo and Lusch 2004: 258; 2008: 7).

Nowadays, the academic debate regarding services is no longer focusing on the differences between goods and services since the offering is seen as a combination of goods and services that create a unique value for the customer (Anderson & Narus 1995: 75; Angelis et al. 2011: 11). The key driver is the idea of value design, value proposition and value through a combination of goods and services (Turunen 2013: 14). Established concepts to explain this idea are bundling, product service systems, and integrated solutions (Windahl & Lakemond 2010: 1278; Brax & Jonsson 2009: 540–543).

3.2. Service and solution business characteristics and competences

The characteristics of traditional products and services associated to successful business concepts is important to study carefully. Most of the industrial companies around the world have long experience of traditional product business before they decide to enter in to real service business. The main differences between product and service business is presented in Table 2. (Salkari et. al. 2007: 9.)

The characteristics of traditionally produced product	The characteristics of services
"Products have detailed specifications"	"Services have been described and illustrated"
"Products are produced in well-planned and controlled processes"	"Services are being implemented"
"Product uniformity is the target"	"In services production, the target is uniqueness"
"Customers are not involved in the production"	"Customers are often involved in the implementation of the services"
"Internal quality control compares output to specifications; improperly produced products can be recalled"	"Customers conduct quality control by comparing expectations to experience; if improperly performed, apologies and reparation are the only mean of recourse"
"Production worker morale and skills are important"	"Service provider morale and skills are critical"

Table 2. Characteristics of traditional products and services (Adapted from Salkari et al. 2007: 9).

Product and service business success is based on company vision. The market, product and service strategies and road maps should be derived from this vision. In services, strategies and road maps seem to be more important than in products. The lack of strategies, road maps and customer involvement can be compensated in traditional product business by examining competitors and market development. On the other hand, in service business the most important factor are direct customer contacts which cannot be replaced. (Salkari et. al. 2007: 9.) Also, as services depend strongly on labour, copying them is more difficult than that of physical products. For immaterial reasons, the development of new services is often also much faster than the development of new products that are manufactured. (Gebauer et al. 2006: 374–375.)

According to BestServ Forum, the most critical competences of a successful service business are identified as follows (Salkari et. al. 2007: 9):

- Knowledge of customer processes by way of handling entities
- Acquisition of new competences needed in a customised service business
- Ability to sell and produce services
- Network build-up in accordance with product and service packages
- Ability to integrate own key competences into related customer processes
- Competence management by way of development and knowledge transfer from the customer

According to prior literature, the solution business has been connected to a number of organisational competencies suggesting that integrated solutions require the development of new organisational capabilities and cannot be treated as bundles added to the company's total offerings. The instructions for building a solution business tend to be fairly straightforward despite of the transition challenges that have been identified. Therefore, the emphasis is on undertaking generic tasks or building capabilities, such as:

- Four major challenges in organising a company to access solution business are as follows: changing company's orientation, the need for new capabilities and skills, the change of structure and processes, and implementing transformation processes in the company.
- A company's focus should be around the customer; the company should develop solution strategy, develop a product portfolio, choose the offering solutions, and manage the customer-oriented ordering process.
- Integrated solutions are based on technical competence, integration competence, market or business competence, and customer partnership competence.
- Organisational capabilities for the solutions consist of a four-phase cycle assuming that the company takes advantage of the "economies of repetition". The first phase includes a unique solution for the customer which is developed in the "first-off" project. The second phase includes the sharing of new capabilities to other

projects. The third phase includes reorganising the functional organisation to support growing business. In the last phase the organisation might become its own business unit. (Brax & Jonsson, 2009: 544.)

3.3. Servitization of manufacturing

The western economies have begun shifting their market share from traditional manufacturing to more product-service oriented systems to remain in the competition with delivered value to the customer (e.g. Wise & Baumgartner 1999; Neely 2008). This is related to the fact that manufacturing companies are increasingly focusing on the use of the product-service offering instead of the manufacturing pure products (e.g. Manzini et al. 2001; Mont 2001; Manzini & Vezzoli 2003). This has led to a situation where numerous manufacturers have been looking for growth from the increased service sales (Wise and Baumgartner, 1999). Thereby, the way to a tightly united product and service combination is recognised as servitization (Vandermerwe & Rada, 1998; Martinez 2010: 450).

Servitization starts often in industrial companies with development of services that support products (Oliva & Kallenberg 2003: 160). They start to innovate services that support customers when their service business matures to a certain level. This also requires mind change where services are not considered as products' add-ons (Mathieu 2001a). In servitization customer centricity is considered essential and it has often led to solutions that provide individualised and interactively designed offers for customers' complicated problems. These solutions include integration of products and services, and the relationship between the buyer and service provider is close. (Korhonen 2011: 32.) The recommendation is that manufacturers turn their whole business into service logic instead of managing service in a traditional way as a separate function (Grönroos & Helle 2010: 565). It is also recommended to involve customers especially in the joint creation of value and in the innovation process of services (Korhonen 2011: 32).

The interest of servitization is growing continuously according to literature, academia, businesses and the government, most of which are based on the belief that the transition

to service is a means of creating traditional manufacturers extra value adding competences. Benefits of these integrated product-service offerings are distinguishing, long-standing and defendable from competition by lower cost economies. (Baines et al. 2008: 547.) Product-service system (PSS) function is particularly close to servitization. According to different debates, PSS, which is a Scandinavian concept, is closely connected with sustainable development and reduction of environmental impact (Baines et al. 2007; Goedkoop et al. 1999; Manzini & Vezolli 2003).

Definition of servitization

The definition of the servitization phenomenon reflects a product centric and undirectional view. Vandermerwe and Rada (1988) who are the earliest contributors of the topic define servitization as ‘‘*the increased offerings of fuller market packages or ‘bundles’ of customer focused combinations of goods, services, support, self-service and knowledge in order to add value to core product offerings*”. Verstrepen and van den Berg (1999) argue that servitization is the transition to product services by “*adding extra service parts to core products*”. Desmet et al. (2003) simplify servitization as “*a trend in which manufacturing firms adopt more and more service components in their offering”.* On the other hand, the approach by Lewis et al. (2004) is more open and product-oriented as they describe servitization as “*any strategy that seeks to change the way in which a product functionality is delivered to its markets*”. Baines et al. (2008) combine earlier definitions and conclude servitization as “*the innovation of an organisation’s capabilities to better create mutual value through a shift from selling product to selling product-service-systems*”. Altogether, there are several definitions of servitization in the literature, the most recognised of which are presented in Table 3.

Author (year)	Definition of servitization
Vandermerwe and Rada (1988)	"Market packages or 'bundles' of customer-focussed combinations of goods, services, support, self-service and knowledge"
Verstrepen and van Den Berg (1999)	"Adding extra service components to core products"
Robinson et al. (2002)	"An Integrated bundle of both goods and services"
Desmet et al. (2003)	"A trend in which manufacturing firms adopt more and more service components in their offerings"
Lewis et al. (2004)	"Any strategy that seeks to change the way in which a product functionality is delivered to its markets"
Ward and Graves (2005)	"Increasing the range of services offered by a manufacturer"
Ren and Gregory (2007)	"A change process wherein manufacturing companies embrace service orientation and/or develop more and better services, with the aim to satisfy customer's needs, achieve competitive advantage and enhance firm performance"
Baines et al. (2008)	"The innovation of an organisation's capabilities to better create mutual value through a shift from selling product to selling product-service-systems"
Martinez et al. (2010)	"The journey or transformation process whereby an organisation enables its product-service offerings"

Table 3. Definitions of servitization (Adapted from Baines et al. 2008: 554).

Features and adoption of servitization

Servitization includes a variety of forms with different features. Potential applications are identified in the literature along the so-called "product-service continuum" (Oliva & Kallenberg 2003; Gebauer & Friedli 2005; Gebauer et al. 2008b). In this traditional manufacturers' continuum, companies offer only their products' add-on services through service providers that, on the other hand, consider services as the most important part of their value creation process (Baines et al. 2008: 556). Chapter 4.1 discusses the product-service continuum more deeply. According to Gebauer et al. (2007b: 12), it is important for companies to take a look at their exceptional opportunities and challenges at different levels of "service infusion" and consciously identify their position in the product-service continuum. As a conclusion, this is supposed to be a dynamic process in which companies identify their position and seek to move in the direction of increasing service dominance (Baines et al. 2008: 556–557).

Based on a case study/case studies, scholars have identified companies' adoption of servitization (Wise & Baumgartner 1999; Mont 2001; Oliva & Kallenberg 2003; Davies 2004). Table 4 presents some of the most recognised examples of servitization adoption. These are cases where companies are shifting to exploit services' downstream opportunities. They can be divided into four categories: 1) embedded services, 2) comprehensive

services, 3) integrated solutions and 4) distribution control (Wise & Baumgartner 1999: 137–139).

Organisation	Description of the adoption of servitization	Author (year)
Alstom	"Maintenance, upgrade and operation of trains and signalling systems"	Davies (2004)
ABB	"Turnkey solutions in power generation"	Miller et al., (2002)
Cargotec	"The company aims to secure profitable growth by focusing on services, digitalisation and people leadership"	Cargotec annual report (2017)
Ericsson	"Turnkey solutions to design, build and operate mobile phone networks"	Davies (2004)
Kone	"Kone`s People Flow concept reflects the stark emphasis on customer value adding effort"	Kone annual report (2017)
Metso	"The revised organizational structure ensures the businesses are built around similar customer, competitive and business dynamics which enables a more focused and agile organization"	Metso annual report (2017)
Nokia	"Nokia's network-infrastructure solutions, providing network equipment and service to carriers"	Wise and Baumgartner (1999)
Planmeca	"We are dedicated to better patient care through groundbreaking solutions that improve the daily workflow of dental and medical professionals around the world"	Planmeca (2017)
Thales	"Pilot training and simulator-building management"	Davies (2004)
Rolls-Royce	"Power by the Hour" guaranteed flying hours for aero engines	Howells (2000)
Xerox International	"Document management services. Guaranteed fixed price for copy"	Mont (2001)
WS Atkins	"System integration services and outsourcing solutions"	Davies (2004)
Wärtsilä	"With its flexible production and supply chain management, Wärtsilä constantly seeks new ways to maintain high quality and cost efficiency – often in co-operation with customers and leading industrial partners"	Wärtsilä annual report (2017)

Table 4. Industrial examples of servitization (Adapted from Baines et al. 2008: 560).

Even with the change, however, servitization alone does not appear to be the solution or the panacea for manufacturers. In fact, servitization is a concept that includes important potential value providing companies with different routes to move up the value chain and to exploit more valuable businesses. This is examined with different companies such as Rolls-Royce “TotalCare” or Kone “People Flow”. Thus, concepts like servitization should not be regarded as applicable universally. Although competitive strategy should not be formed on the basis of services which in general are considered as vital factors for manufacturers, it is also claimed that manufacturers cannot succeed without providing services such as after-sales support, training and financing for customers. However, through excelling operation excellence or product leadership, it is possible to achieve the success in servitization. Still, there are many important challenges to be faced for manufacturers who consider the provision of services as their way to success in the future. For example, in order to be efficient the manufacturers need to realise the customer value of

their services. In addition, to be able to support this value offering manufacturers must configure their products, technologies, operations and supply chain if needed. (Baines 2008: 562–563.)

Future of service business

The future seems bright for companies that are providing industrial maintenance services. Value networks between companies are blurred due to both outsourcing and diverse collaborative relationships. Customer relationships are also becoming blurred as the processes of the service provider and the customer are increasingly integrated. The industrial maintenance business is gradually moving into a knowledge-intensive business, where the boundaries between products, services and customers are blurred. (Ojasalo & Ojasalo 2010: 233.) The service business has been perceived as a key model for future growth. At the same time, service innovations have become more common as technology companies have sought opportunities for service activities. However, succeeding in service innovations requires challenging the existing businesses at both strategic and operational levels. (Grönroos et al. 2007: 14, 48–49.)

3.4. Maintenance as industrial service

Maintenance services are only a small part of the wide range of industrial service offering. Over the last two decades both industrial and maintenance services have developed significantly. Nowadays, companies have adopted potential and positive impact of services on their business.

Manufacturers of industrial products are taking up the provision of services as part of their business. Manufacturers have provided services such as installation and maintenance, but in most cases, this has been considered as a necessity rather than a profitable business. (Kosonen 2004: 12–13.) In order to enable suppliers to provide more support to their customers during their physical product life cycle, they often rely on a range of services that are traditionally referred to as after-sales services. Nowadays, we usually talk about industrial services. For example, alongside a physical product a service contract

or customer training can be offered. This may be a step forward, but it is often difficult to get customers to pay for these services. Therefore, new perspectives and measures are needed. (Grönroos 2007: 29.)

Maintenance background

The change in the way companies think about maintenance can be summarised in three different steps which are presented in Figure 2. At first, maintenance was seen as a necessary evil which had to be carried out: "*It costs what it costs*". At that time there were no other alternatives because of the lack of advanced technology to prevent defects. Maintenance was started to be considered as an important support function for production and manufacturing after the Second World War and the advent of technical changes. Preventive maintenance and condition monitoring were introduced as a result of advent techniques during the years 1950–1980 which led to change in maintenance cost perception: "*It can be planned and controlled*". Nowadays, maintenance is increasingly seen as an integrated part of a company's business processes and it is discovered as: "*It creates additional value*". Measuring maintenance performance has also become an essential requirement for today's industry especially when maintenance plays an important role in the long-term profitability of the company. (Parida & Kumar 2006:239–240.)

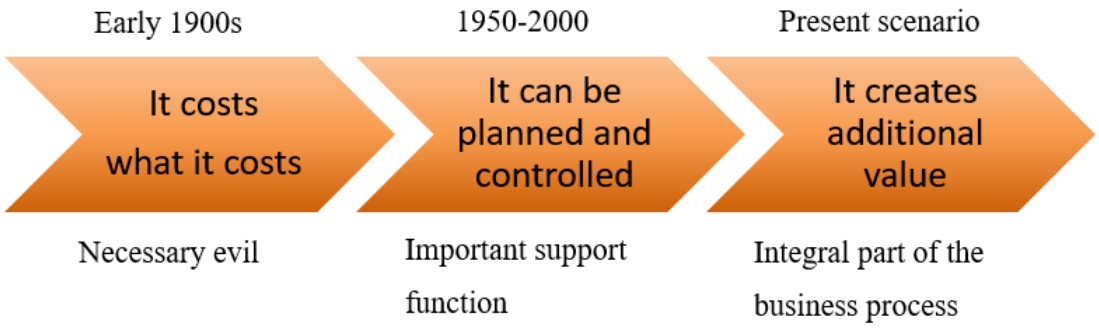

Figure 2. Paradigm shift in maintenance (Adapted from Parida & Kumar 2006:240).

Maintenance types

The basic prerequisite for effective maintenance is the division of actions into different types. For example, you can monitor the effectiveness of maintenance and distribute costs or workloads between different types of work. This provides also useful data for analysing the operation. (Järviö 2017: 46.) There is a wide range of different types of maintenance that can be categorised in several different ways. According to PSK 7501 (2010: 32) standard, maintenance is divided into two main categories as planned maintenance and breakdown maintenance. The planned maintenance is further subdivided into preventive maintenance (and further divided into three categories which are pre-determined maintenance, condition monitoring and condition based planned repairs), refurbishment and improvement maintenance. The subtypes of the breakdown maintenance are immediate and deferred repairs. Breakdown maintenance can be immediate, where production is interrupted immediately after the fault is detected and corrective actions are taken before the operation can be continued. On the other hand, there is no need to perform deferred repairs immediately, they can be postponed to a more convenient time. The maintenance types are shown in Figure 3.

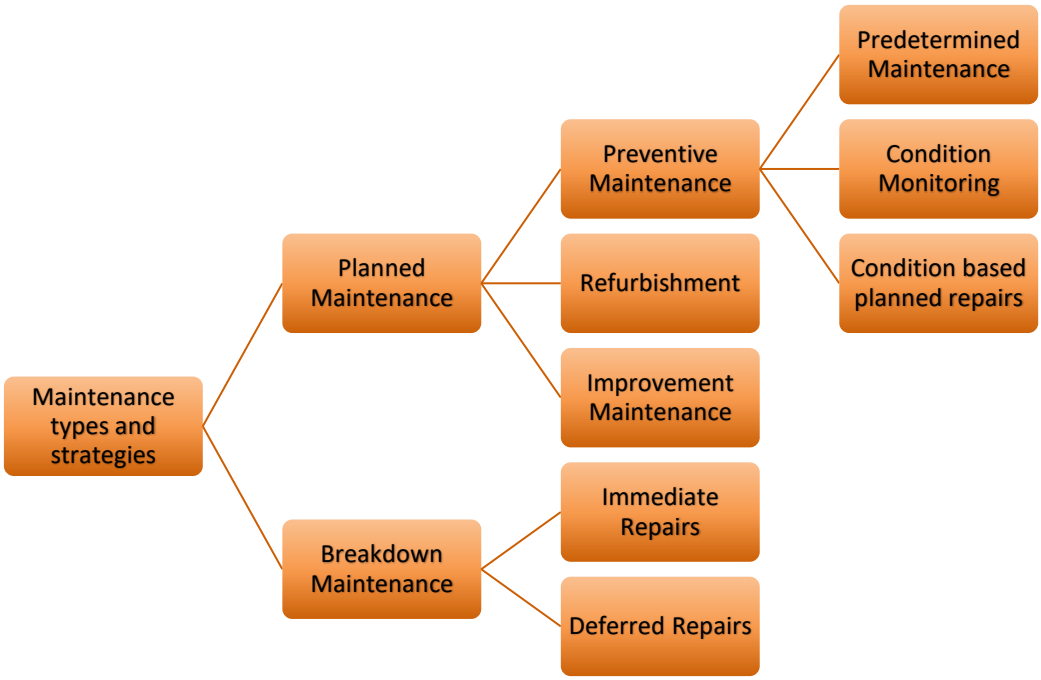

Figure 3. Maintenance types according to PSK 7501 standard (PSK 7501 2010: 32).

Company finance

Maintenance is an area of business in which normal business models exist. One of the most important drivers is the economy. The activity must be such that it fulfils the conditions of the business where rationality is the most important. It must be remembered that the task of the entire plant is to produce commodities as productively as possible. This is also the main goal of the maintenance department. Business productivity is generated by the difference between income and outcome. (Järviö 2017: 183–184.) Studies have shown that effective maintenance can affect the productivity of the production process as well as profitability, and hence the performance of the company (Maletic et al. 2014). Industrial operating costs can be divided into direct costs, indirect costs and loss of revenue. The most common direct costs of maintenance (e.g. salaries, labour costs, spare parts, storage, subcontracting) include the costs of operating, which can be directly demonstrated as a result of maintenance. Indirect costs are characterised as difficult to allocate or they cannot be reasonably divided between different maintenance activities (e.g. wreckage, renewal, overwork costs, buffer stocks, oversized fixed assets, disproportionate financial assets). In turn, loss of revenue can be seen as a reduction in sales volume or price due to maintenance failures and as loss of profit in the short term. (Järviö 2017: 183–184.)

Maintenance management

Maintenance management (MM) includes all management functions that define maintenance objectives, priorities, strategy and responsibilities. Maintenance management has been studied and various frameworks and management models have been created around it since maintenance has been seen as an important part of the company's business. In scientific publications, TPM (Total Productive Maintenance), CMMS (Computerized Maintenance Management System), RCM (Reliability Centered Maintenance), CBM (Condition Based Maintenance), PM (Preventive Maintenance) and Asset Management have all provided the most prominent examples of maintenance management techniques. (Crespo & Gupta 2006: 314; Järviö 2017: 30.)

According to Crespo and Gupta (2006: 317–318) it is important that maintenance management is aligned with all three business activities which are strategic, tactical and operational. In a strategic level, actions are transformed in a way that business priorities are turned into maintenance priorities which means that the company's strategy should be also reflected in the maintenance strategy. This process helps to address medium and long-term strategies for current and / or potential gaps in equipment maintenance performance by achieving these priorities. In a tactical level, the proper definition of maintenance resources (e.g. skills, materials, test equipment etc.) is determined so that the maintenance plan is fulfilled with the assistance of strategy implementation. The operational level means the actual execution of the work. A detailed program would be implemented with all the specified tasks and assigned resources as a result of this level. Lastly, the operational level ensures that the actual execution of the work is carried out by the skilled technicians, in the scheduled time, following the correct procedures and using proper tools. After the work is done, the data would be documented in the information system as a result of this level.

The maintenance management process which is presented above includes only the course of action while a framework should be understood as a supporting structure that enables this process model. Also, the process can be considered as a chain of events for maintenance management activities while the framework provides technology for its execution. For this reason, it is good to distinguish these two things in order to not confuse maintenance tasks and the tools that enable them. The framework is simply composed of three main pillars: 1) Information technology (IT), 2) Maintenance engineering techniques and 3) Organisational techniques (Crespo & Gupta 2006: 317–318). The framework is presented in Table 5.

1. Information technology	CMMS, E-maintenance, condition monitoring technologies
2. Maintenance engineering techniques	RCM, TPM, reliability data analysis, maintenance policy optimization models, OR/MM models
3. Organizational technique	Relationship management techniques, motivation, operators involvement

Table 5. The MM process and framework (Adapted from Crespo & Gupta 2006: 319).

Measuring maintenance

Continuous service development requires measurement of performance to assess and improve performance. There are a large number of different indicators. Therefore, it is essential to select used indicators so that they are linked to the company and its maintenance strategy. The maintenance scorecard must always be built according to the situation and the operating environment. Maintenance performance measurement (MPM) can be divided into three phases: the design of the performance measures, the implementation of the performance measures, and use of performance measurement, which means that the results should be used for analysis and performance review. (Parida & Kumar 2006: 248.)

There are a large number of maintenance metrics available. Process industry maintenance indicators are presented for example in PSK 7501 standard. Maintenance indicators can be categorised as economic and technical indicators. Financial figures allow monitoring internal results and their development as well as a certain degree of comparison with the maintenance of other similar devices and systems. Technical indicators, in turn, give the maintenance manager the ability to monitor the technical performance of the device or system. (Ojasalo & Ojasalo 2008: 53.) The purpose of the meters is to measure how well the organisation achieves its objectives. Laine (2010: 244) emphasises that every company has to create its own meter based on strategy, operating model and competitive environment. However, it is important that economic and functional indicators are always measured in parallel. In addition, the meter should be hierarchical so that it measures individual important functions as well as important issues for the success of the entire organisation. The meter hierarchy can be divided into four different levels (see Figure 4).

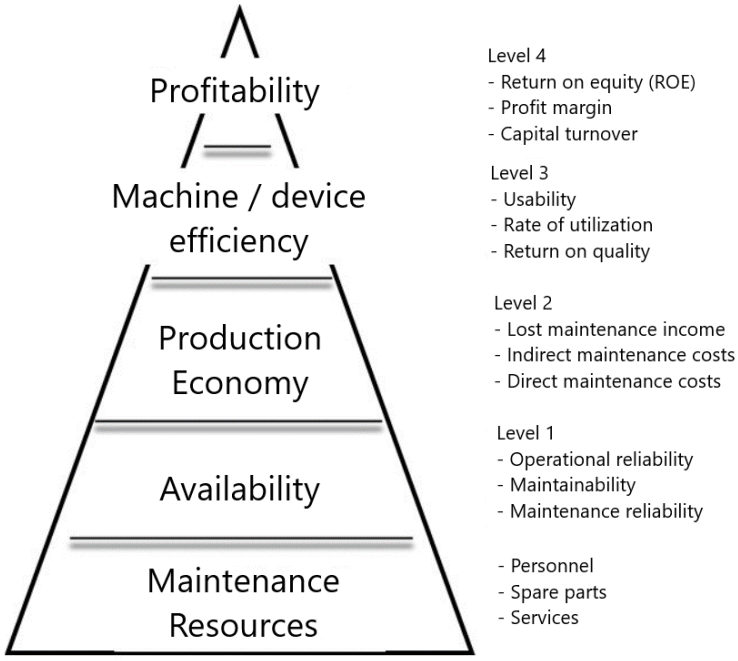

Figure 4. The hierarchy of meter and the levels of organisation (Adapted from Laine 2010: 245).

The first level of the hierarchical meter includes maintenance resources and measurement of usability. The first level should measure more precisely how the labour costs have been used to repair a particular machine, and how the ratio of planned and unplanned maintenance work is divided, usability indicates the efficiency of the maintenance. On the second level of the maintenance meter lost income as well as direct maintenance costs (e.g. work, material, purchased services) and indirect maintenance costs (e.g. downtime and quality problems) are measured. The third level of the hierarchy is the result of the calculation of the overall equipment effectiveness (OEE). Meters can be created for computation of each section (e.g. usability, speed and quality). On the fourth and final level, the profit margin, capital turnover and return on equity (ROE) are used to measure the overall profitability of the company. The attention is turning on how the maintenance affects the company's financial performance when considering the whole operation. It is about analysing the income and costs of a business economy with several tools available. When it comes to maintenance, the focus is usually only on the cost, because the income is generated indirectly and difficult to measure. However, it is important to understand the cause and effect relationships between maintenance and company performance. (Laine 2010: 244–252.)

4. SERVITIZATION AS A PROCESS OF TRANSFORMATION

Major changes are required when a component manufacturer decides to begin a transformation to a service provider in order to succeed. The foundations of the strategy must be renewed, and the organisational structures and product development must be aligned with the new approach. In other words, the change affects all the company's operations from management to product development and from manufacturing to sales. The whole company must learn to appreciate the industrial services and the way they are offered. This is not an easy task, especially not for traditional component manufacturing companies. (Kosonen: 2004: 17; Ojasalo & Ojasalo 2008: 25–26.)

Companies have noticed that services bring life-cycle extended effect for products and an ability to provide the substantial income for the company (Oliva & Kallenberg 2003: 160–161). Customers no longer expect to get the perfect product, but they expect the manufacturer to respond quickly and professionally with available after-sales services to potential device failure situations such as immediate repairs and planned maintenance. In general, the customers are not dissatisfied with the defects in the device but might be that with the after-sales services from which they expect more nowadays. The customers' needs and requirements on service quality have increased for industrial services alongside with products. (Cohen et al. 2006: 130.)

4.1. Transition stages

The transition of an industrial company from manufacturing to service business usually takes place through certain phases or levels. It is important to be able to control the stages of the change process and decide which level the company desires to move to or stay at, in other words, what combination of manufacturing and service business the company is capable and willing to deliver. (Ojasalo & Ojasalo 2008: 26.)

Designing and understanding the strategic change in the value chain that is associated with the change is essential when an industrial company decides to expand from manufacturing to services. However, the strategic planning of an industrial company should

not only focus on the market share, increasing the cost-effectiveness of manufacturing, fusion and the formation of large corporations. Seeking and utilising the service activities that the company already has or in which it can develop unique expertise, so that the company can gain the best possible expertise for the production of the service, is important especially from the strategic point of view. The overall change in the strategic decision-making situation related to change is illustrated in the Figure 5. (Ojasalo & Ojasalo 2008: 26–27; Oliva & Kallenberg 2003: 161–162.)

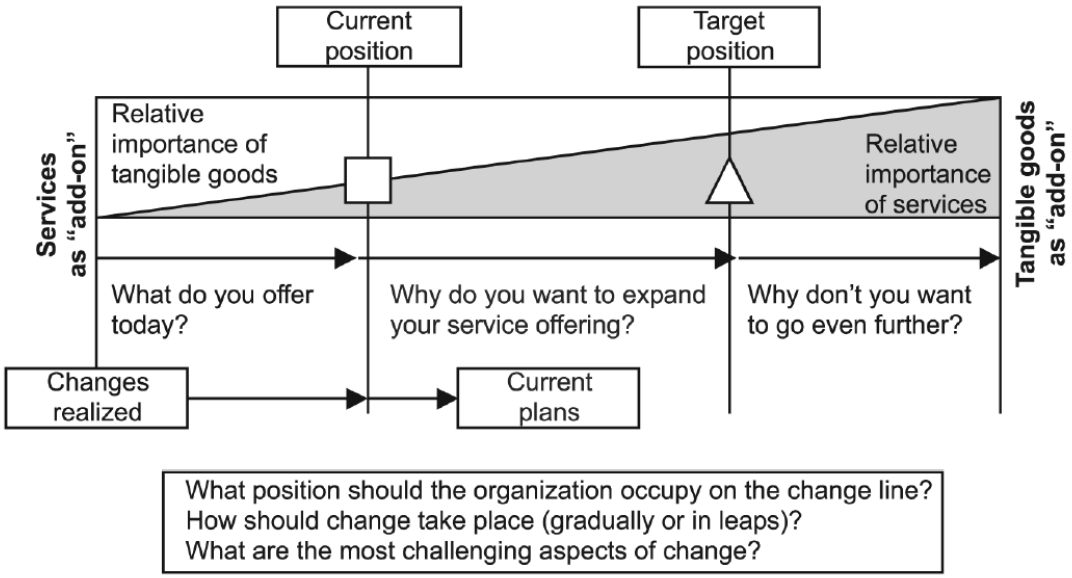

Figure 5. Product-service continuum (Oliva & Kallenberg 2003: 162).

Kalliokoski et al. (2003: 20; 2008: 42) provided the model describing the change process in which the change has been examined simultaneously from two perspectives. The first viewpoint describes the competencies of the industrial company, in other words, the skills that are categorised into four different levels. At the lowest level, the customer's purchasing activity is known, then the expertise enters first into the customer's individual operations, and then into the customer's processes, and at the highest level, the competencies are related to in-depth understanding and expertise of the customer's business. Another aspect describes the orientation towards customer relationships, which are also divided into four different levels. In the first level, the customer is supplied parts, equipment and related services, and in the following levels customer relationship orientation is transferred through operations and processes to the customer's entire business. At different

levels, existing industrial companies are characterised as follows: machine supplier, solution provider, maintenance partner, performance partner and value partner. Change process model is presented in Figure 6. (Ojasalo & Ojasalo 2008: 29–30.)

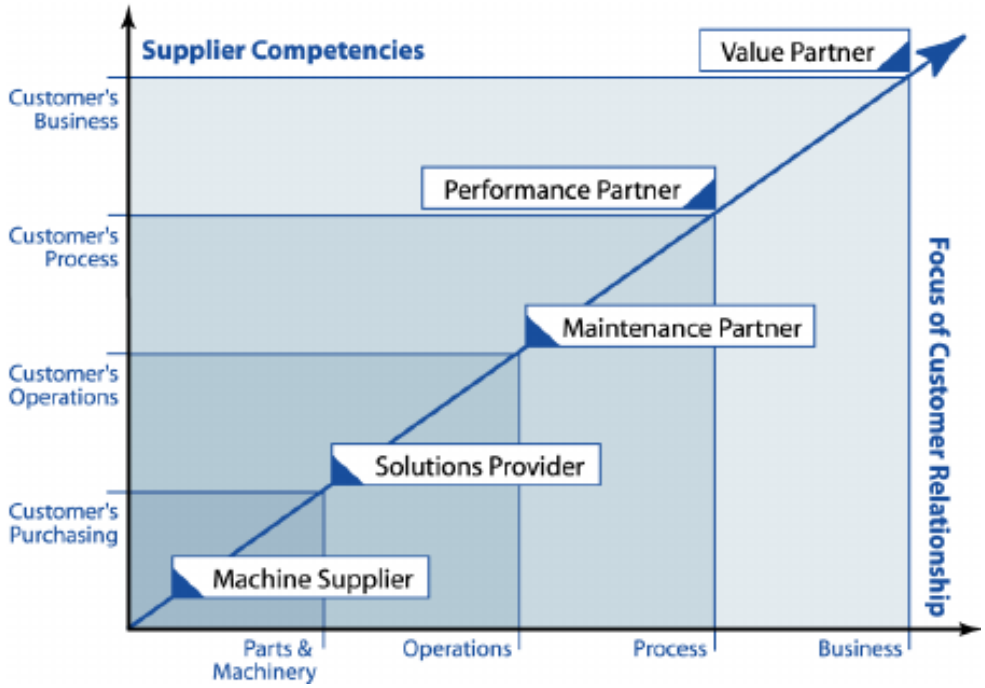

Figure 6. Transition stages of the change process (Kalliokoski et al. 2003: 20; 2008: 42).

In the following chapters industrial transformation process from manufacturing to service business is discussed in more detail. The focus is on four different phases through which a strategic change has been observed to occur in the value chain. The steps are as follows (see Figure 7) (Ojasalo & Ojasalo 2008: 30–31; Oliva & Kallenberg 2003: 164–165):

1. Consolidating product-related services
2. Entering the installed base service market
3. Expanding to relationship-based and process-centered services
4. Taking over the end-user’s operation

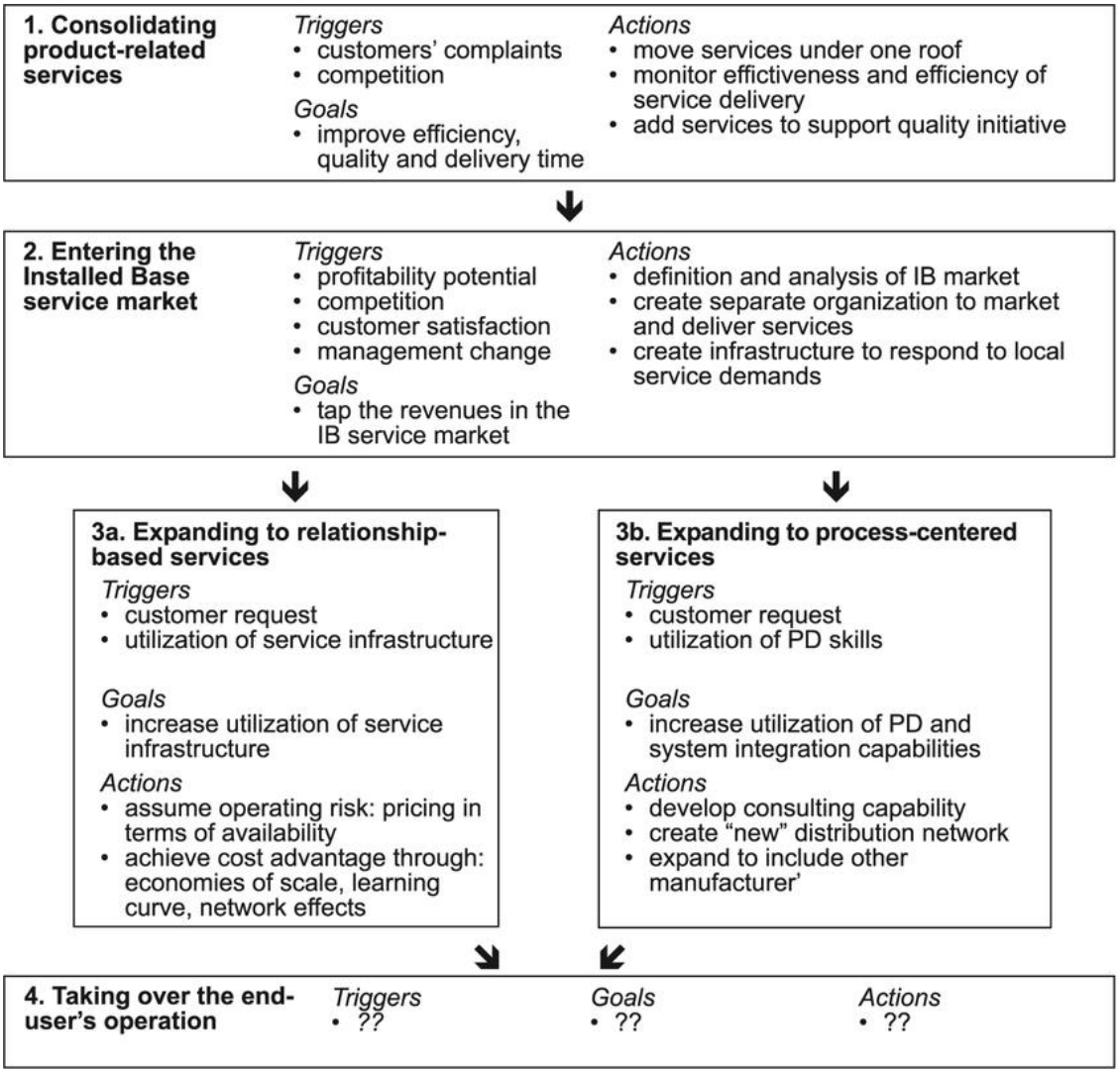

Figure 7. Process model for developing IB service capabilities (Oliva & Kallenberg 2003: 165).

An industrial company focuses on certain issues and increases its use of new skills at each stage. Figure 7 illustrates a process in which the industrial company increases its expertise in transition from manufacturing to service business. In general, offering means an entity that consists of products and services and related brand images, in other words, it means everything that the company offers to the market. The company's ability to produce value and obtain financial compensation becomes concrete through the offering. (Ojasalo & Ojasalo 2008: 32.)

4.2. Phase 1: Consolidating product-related services

The first step of the process is to consolidate a company's current service offering through a single organisation, which aims to improve performance, efficiency, quality and delivery time of the services, to create additional services to supplement service offering and to sell more products. This consolidation of services includes also developing a monitoring system to assess the efficiency and effectiveness of the service delivery. Managers will realise for the first time the size of the service market with this monitoring system and consider the share of services in the company's operations. Typically, organisations consider this integration as the first step to improve the service delivery and see that services are an important part of the consumer satisfaction indicators. (Oliva & Kallenberg 2003: 165–166; Ojasalo & Ojasalo 2008: 36–37.)

Product support related business potential can be assessed by looking at all the activities and costs associated with the entire product life cycle. Product-related costs and activities that are related to product-lifecycle provide a total potential for product support business including physical product sales, after-sales services, and product use and operation. Here, we talk about the costs related to the product from the point of view of the company that buys the device and the business potential from the point of view of the selling company that can utilise the potential as a real cash flow. (Ojasalo & Ojasalo 2008: 34.)

Developing better service concepts helps to realise the business potential associated with product support. For example, a good product support service concept provides the customer with a quick responding time, the right professionals and spare parts, as well as flexible administrative systems, (i.e. ease of bureaucracy). Therefore, the service concept needs to be carefully designed and tailored to meet the specific needs of different customers and customer groups. Professional product support requires more than a quick responding time to customer problems. Product support can be broadly understood as a range of services that continuously and proactively improve the performance of processes that are linked to a customer's product, such as preventive maintenance, training, software and hardware upgrades, and special product support packages for old products. Different

customers obviously have different needs depending on the size of the customer, the attitude towards internal product support, downtime costs and other factors. (Ojasalo & Ojasalo 2008: 34–35.)

As a conclusion, the above mentioned changes create inside the company “transparency of numbers” which is required in order to monitor the success or failure and for the clear direction of the implemented changes. In turn, improving the quality of existing services creates a reputation of a reliable service provider among clients. (Oliva & Kallenberg 2003: 166; Ojasalo & Ojasalo 2008: 36–37.)

4.3. Phase 2: Entering the installed base service market

Entering the installed base service market means recognising the profit potential in the service sector and setting up structures and processes for its exploitation. The profit potential is often realised through the monitoring mechanism implemented in the previous stage or after the observation of the competitor's services’ high margins in the service market. Although the triggers of organisations for going to these markets vary (e.g. top management change, a successful competitor or a customer satisfaction survey), the process that organisations follow at this stage is predictable. (Oliva & Kallenberg 2003: 166.)

An industrial company has two major challenges at this stage of the transformation process. The first challenge relates to a cultural change when moving from product-oriented organisation to a service-oriented organisation. The main issue of the cultural change is the change to a mindset in which the services are appreciated and consideration of effective ways of selling, producing and invoicing them is seen important. According to Oliva and Kallenberg (2003: 166), a critical factor in the cultural change is the creation of a separate unit responsible for the service business. However, it is often important at the beginning of the transformation process to establish the company's service functions under one unit if the company wants to successfully expand from manufacturing to services and develop a functional service offering. This new unit has its own sales and technical personnel. In addition, it also has its own information systems to support and monitor the service business. The information system also indicates the importance of the service

business for the overall profitability of the company to the rest of the organisation. (Ojasalo & Ojasalo 2008: 36; Oliva & Kallenberg 2003: 167.)

Another major challenge at this stage of the transformation process is to create a geographically wide (even globally if required) service infrastructure which is capable of responding to service production requirements of installed base locally. However, this requires investment that does not usually generate revenue immediately. At the operational level, the company must develop two capabilities to be able to manage distributed service network effectively: the first is the ability to diffuse services within the network and the second is the ability to lead a wider service personnel. Finally, the network must make a decision on the level of the service offering standardisation in order to balance the transferability of services in different markets and tailor-made services to individual end-users. (Ojasalo & Ojasalo 2008: 36; Oliva & Kallenberg 2003: 167.)

It is important inside the company to make the service business transparent through numbers so that the success of the services can be evaluated and directed in the desired direction. In this context, various indicators are being developed to assess the efficiency and quality of the services. (Ojasalo & Ojasalo 2008: 36–37.)

The next step for the service unit is usually the expansion which takes place by developing and providing new kinds of industrial services related to the own physical products of the company, or by providing services for another manufacturing company's equipment. At this point it is important for the service unit to internally develop a well-functioning service organisation and to create indicators for business success as well as for customer and employee satisfaction. Externally, the service unit establishes itself as an active market player, which is actively seeking new business opportunities. In general, companies establish themselves in a strong position as installed base service providers before moving to the next phase of the transformation process. (Ojasalo & Ojasalo 2008: 37; Oliva & Kallenberg 2003: 167.)

4.4. Phase 3: Expanding to relationship-based and process-centered services

The expansion of the service offering usually takes place when the core functionality of the service unit is established. The transformation may occur along two transition paths (A and B). Table 6 illustrates this change. The transition path A changes the focus of interaction with the customer from a transactional to a relationship-based interaction which is particularly evident in the pricing of the service. In the transactional-based interaction each service, spare part and working hour used is billed. On the other hand, in the relationship-based services, a fixed price is agreed for a certain period of time, covering all services provided to the customer during that period. In the case of product services, the reason why a company wants to move from transactional to relationship-based interaction (Table 6: transition vertically from top to down) is often the fact that a service organisation represents a fixed cost to the industrial service company, and thus the capacity utilisation of a service organisation is critical to profitability. The long-term service agreement reduces variability and unpredictability and enables better utilisation of service organisation's capacity. (Ojasalo & Ojasalo 2008: 38; Oliva & Kallenberg 2003: 167–168.)

	Product-oriented services **Transition path B**	End-user's process-oriented services
Transaction-based services **Transition path A**	*Basic installed base services*	*Professional services*
	Documentation	Process-oriented engineering (tests, optimization, simulation)
	Transport to client	
	Installation/comissioning	Process-oriented R&D
	Product-oriented training	Spare parts management
	Hot line/help desk	Process-oriented training
	Inspection/diagnosis	Business-oriented training
	Repairs/spare parts	Process-oriented consulting
	Product updates/upgrades	Business-oriented consulting
	Refurbishing	
	Recycling/machine brokering	
Relationship-based services	*Maintenance services*	*Operational services*
	Preventive maintenance	Managing maintenance function
	Condition monitoring	Managing operation
	Spare parts management	
	Full maintenance contracts	

Table 6. Transactionality, relationship orientation, product orientation and process orientation of industrial services (Adapted from Ojasalo & Ojasalo 2008: 39; Oliva & Kallenberg 2003: 168).

Usually, an industrial service provider wants to move from transactional-based to relationship-based services to achieve better capacity utilisation. The question is, does the customer have the motivation to move on to a longer customer relationship? The customer is not interested in paying for equipment monitoring or periodic inspections if they do not directly add value. The change from transactional-based pricing to relationship-based pricing must be justified by calculations which is expressed as the value of a new kind of service and pricing prerequisite in euros for the customer. The calculations should take into account, among other things, the preventive or reduced downtime of the device and the cost reductions for the customer. (Ojasalo & Ojasalo 2008: 40; Oliva & Kallenberg 2003: 168–169.)

The transition path B changes the value proposition's focus on the efficiency of the physical product to the efficiency and effectiveness of the customer's processes (Table 6: transition horizontally from left to right). In this case, the physical product becomes a part of the value proposition without being the central point. The focus of the industrial company will shift from the equipment manufacturer to the total service provider which is usually carried out with various consulting services. The biggest change is that the services now cover the entire lifecycle of the physical product and are no longer just about installing and deploying the device. The challenge in this path is to develop the needed infrastructure for expert services, human resource management, knowledge management, new kind of service production and distribution network, and new contacts with customer organisations. (Ojasalo & Ojasalo 2008: 40; Oliva & Kallenberg 2003: 169.)

According to Oliva and Kallenberg (2003: 170), there is no clear recommendation on which transition path industrial company should expand to the service business. However, the company should seriously consider whether it makes sense to try to expand along both paths at the same time. This option is often so demanding that it is generally advisable to go through different transition paths in a row rather than in parallel. (Ojasalo & Ojasalo 2008: 40–41.)

4.5. Phase 4: Taking over the end-user’s operation

The use of the equipment has been traditionally an integral part of the customer’s business. One option to develop a service concept is that the manufacturer of the equipment also manages its use, in other words, managing the operation based on the service. The cost to a customer of using a product during its life cycle is in many cases greater than the cost of purchasing, spare parts and servicing. However, if the equipment manufacturer suggests that it could also handle all or a part of the use of the equipment, the customer may experience it as an attempt to penetrate their business and become in the customer's eyes a competitor instead of a supplier. Therefore, the customer's needs and business need to be known in-depth before proposing to the customer such a ready-to-operate and operational co-operation. (Ojasalo & Ojasalo 2008: 41.)

A customer of industrial services often wants to be released from a situation of experiencing burden and effortless service. The burden of the customer consists of their current problem, administrative processes, risk and the need to spend time and money on dealing with the situation. For this reason, a customer of industrial services often wants comprehensive solutions. (Ojasalo & Ojasalo 2008: 44–45.)

Understanding the customer's maintenance strategy is an important prerequisite for planning successful product support services. The customer’s maintenance strategy can be either designed or not. The customer's maintenance strategy includes a decision on the extent to which the customer wants to maintain and develop the related know-how, and on the extent to which the customer wants to outsource equipment’s maintenance to a service provider. In general, companies arrange the maintenance of their products so that it is partly or fully outsourced. (Ojasalo & Ojasalo 2008: 42–43.)

In the last phase of the transition stage of the change process (see Figure 7), the company providing industrial services has expanded its focus from transactional sales to customer relationships and from products to customer processes. However, few industrial companies have progressed to this stage in their service business, as it requires that the company

first establishes a solid foundation for industry maintenance and expert services. Development of expertise inevitably takes time and requires the accumulation of experience. (Ojasalo & Ojasalo 2008: 43–44; Oliva & Kallenberg 2003: 170.)

If an industrial company extends to services along both transition paths (see Table 6), it can be considered as transforming itself from a manufacturing company into a service providing company. This means both tailoring services and proactive approach to the customer needs. The proactive approach is about anticipating and identifying the customer's invisible needs. Thus, in addition to the recognised needs, the customer may have "fuzzy" expectations that it may not be able to identify by itself. If these expectations do not materialise, the customer feels that the quality of the service is unsatisfactory even though they do not know exactly why. The customer may also have implicit expectations, which they see as self-evident and do not actively and consciously even think of the possibility that they would not be realised. (Ojasalo & Ojasalo 2008: 44.)

4.6. Benefits of servitization

In the late 1980s, the first notion of servitization was introduced by Vandermerwe and Rada (1988). According to them, manufacturing companies should servitize for the following three reasons: 1) lock out competitors, 2) lock in customers and, 3) increase level of differentiation. They also claimed that servitization of business is a natural next step or new opportunity for some manufacturing companies. Besides, manufacturing companies have already experience of providing services by selling and offering support to products (Oliva & Kallenberg 2003: 165). Though, services that support the product have traditionally been seen as an unprofitable necessity, and therefore their development has been fragmented since the minimum amount of effort in the service operations structure has been applied. Other authors pointed out economic and environmental benefits of servitization in addition to strategic rationales (Goedkoop et al. 1999: 3; Wise & Baumgartner 1999: 134).

The increasing global competition has led to a more complex market and an increasing demand for customised services. This has provided opportunities for services as value-

adding components which manufacturing companies are exploiting in their service business. (e.g. Brax & Jonsson 2009; Neu & Brown 2008; Neely 2008.) In this kind of market structure, it makes economic sense for manufacturers to offer customers life time support and different services for their original equipment, especially when the product's life cycle is extended. Wise and Baumgartner (1999: 134) also stated that product combinations of growing installed base and slow product sales make product-related services appear as tempting opportunities for manufacturing companies. In extending to service business, the main benefits are financial, marketing and strategic opportunities (Gebauer et al. 2006: 374).

Table 7 presents opportunities for companies that are moving towards services recognised in the academic literature (e.g. Mathieu 2001b; Oliva & Kallenberg 2003; Gebauer & Friedli 2005; Gebauer et al. 2006; Gebauer & Fleisch 2007). However, the purpose of this table is not to say that manufacturing companies should move away from offering or producing tangible goods. Also, the development of traditional manufacturing business is still important because it provides a key part of the offering and often includes a huge amount of invested capital. Therefore, service and service-centricity are increasingly seen as requirements for manufacturers in servitization and the main challenge seems to be balancing the company's focus on both products and customers. Brax and Jonsson (2009: 555) also confirmed that it is essential for manufacturing companies to identify the best suitable way for them to become pioneers in the industry by offering products and services.

Author (year)	Financial	Strategic	Marketing	Environmental
Vandermerwe & Rada (1988)		"Creating obstacles to competitors"	"Idenfying end customer's issues"	
		"Differentiation in offering"	"Delivering customized products"	
			"Relationships through broader offering"	
Wise & Baumgartner (1999)	"Growth in revenue"	"Durable cost advantage"	"Building customer allegiance"	
	"Expanding installed base"	"Substantial scale barriers to competition"		
	"Higher margins"	"Manufacturers well positioned to exploit many downstream opportunities"	"Delivering combination of services that minimizes the overall costs"	
	"Fewer assets"	"Examing customers activities"		
	"Steady service-revenue streams"			
Mathieu (2001a)	"Raise revenues"	"Differentation opportunities"	"Overall client satisfaction"	
	"Reducing the vulnerability and the volatility of cash flow"	"Within commodities market"	"Inprove new-product adoption"	
	"Higher shareholder value"	"Building indistry barriers to entry"	"Strengthen the client's confidence and the supplier's credibility"	
	"Pricing of product and services"	"Higher organizational intensity"	"Increases both first-time and repeat sales"	
	"Optimal use of its capacity and fixed resources"	"Higher service specifity"	"Enhances market share"	
			"Effective way to maintain ongoing relationship"	
Oliva & Kallenberg (2003)	"Substantial revenue can be generated from an installed base of products with a long life cycle"	"Less visible and more labor dependent are much more difficult to imitate"	"Create more flexible firms"	
	"Higher margins"	"Sustainable source of competitive advantage"	"Narrower definitions of core competencies"	
	"More stabel source of revenue"		"Increasing technological complexity"	
			"Higher specialization"	
Penttinen & Palmer (2007)	"Higher profitability"	"Effective strategic positioning"	"Improving market offering and customer relationships"	"State of readiness 24 hours a day in the event of environmental incidents"
	"Greater customer retention"	"Possible value-added"	"Possible innovation"	"Environmental cluster"
	"Steadier revenue streams"	"Possible co-development of product"		"Envrionmental protection"
Brax & Jonsson (2008)	"Higher margins with steadier revenue"	"Becoming part of customer's operations"	"Close collaboration between customers and providers"	"Predicting the occurance of failures"
		"Further exploitation of technological expertise"	"Incorporating the customer perspective"	"Performing the required maintenance tasks"
		"Form an important feedback loop to product development"	"Strengthening customer relationships"	
			"Integrated, turn-key and full service contracts"	
			"Aim to optimize the total cost for the customer"	
			"Solidify customer base"	
			"Gather customer knowledge"	
Baines et al. (2008)	"Higher profit margin and stability of income"	"Differentiation in manufacturing offerings"	"Create customer loyalty"	"Sustainability and reduction of environmental impact"
	"Less sensitive to price-based competition"	"Provide important competitive opportunities"	"Induce repeat-sale"	
	"Counter-cyclical or more resistant to the economic cycles"	"Less visible and more labor dependent are much more difficult to imitate"	"Intensifying contact opportunities with the customer"	
		"Increase barriers to competitors"	"Gaining insight into customers' need and are enable to develop more tailored offerings"	
Martinez et al. (2010)	"Higher revenues and margins"	"Less easy to replicate"	"Develop more tailored offerings"	
	"Corporate profitablity"	"Competition on the basis of value delivered rather than on the basis of cost"		
		"Sustainable competitive advantage"		
		"Strategic product differentation"		

Table 7. Benefits in servitization.

Financial benefits

The economic dissertations claim that services are expected to bring additional financial benefits to manufacturers. Higher profit margin compared to goods and stabile income due to their resilience to economic cycles are the main financial drivers presented in the literature (e.g. Wise & Baumgartner 1999; Gebauer & Friedli 2005). According to Wise and Baumgartner's (1999: 134) estimation, service revenues might be one or two times bigger than new product sale for manufacturers with high-installed product bases such as aerospace, automotive or other sectors. In addition, manufacturers' downstream movement allows to take advantage of an existing installed base (Gremyr et al. 2010: 161). These arguments are based on the service potential growth opportunities in stabilised market operating companies (Gebauer et al. 2007a: 12). Most companies find it very difficult to successfully exploit the financial potential of extended service business. Many product manufacturers face a phenomenon in which companies invest in their service business expansion or in service portfolio improvement, which obviously leads to higher costs. However, this investment does not always result in as high returns as expected. The growth of service revenue does not meet the planned aims due to growing costs and shortage of the same income. In manufacturing companies, this phenomenon is called "service paradox" (see Figure 8). (Gebauer et. al. 2005: 70–71.)

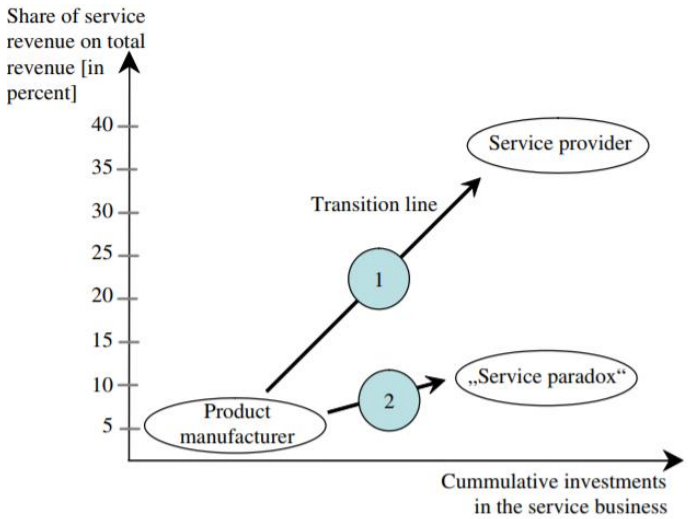

Figure 8. Transition line and service paradox (Gebauer et al. 2005: 70–71).

Strategic benefits

The strategic benefits of servitization are based on differentiation criteria and services offered by marketing opportunities (Gebauer et al. 2011: 1270). Vandermerwe and Rada (1988: 314) stated in their earliest contributions that customers are central drivers for servitization. In other words, the market benefits depend significantly on customer needs. The focus has also shifted from transactions to long-term customer relationships since the customer is now placed in the middle of the strategy (Gebauer & Fleisch 2007: 340; Penttinen & Palmer 2007: 552). Services are often more sustainable, less visible and more labour dependent, difficult to imitate and obstacles to competitors which provide competitive advantage for companies (e.g. Oliva & Kallenberg 2003; Gebauer & Friedli 2005; Gebauer et al. 2006; Mathieu 2001b). Companies with a wider range of services can offer customers more assistance with product utilisation, i.e. to expand their business to broader offerings, companies position themselves differently with strategic choice. Some services are identified as necessities for customers which operate as obstacles to entry to the market. (Baines et al. 2008: 557–558.) Mathieu (2001a: 44) summarises that the more accurate and powerful the service is the higher the resulting strategic benefits.

Marketing benefits

In general, services can be used as a means of marketing to sell more products (e.g. Gebauer et al. 2006; Gebauer & Fleisch 2007). In the marketing literature, it is well noted that the service component has a great importance and influence on the decision of purchasing (e.g. Mathieu 2001a; Gebauer & Fleisch 2007). This applies to customers who are increasingly demanding for services particularly in business-to-business or in industrial market (e.g. Vandermerwe & Rada 1988; Oliva & Kallenberg 2003; Slack 2005). The reason for this is the pressure to create more specific definitions of core competencies, more flexible companies, and advanced technological complexity which often lead to growing pressures to outsourcing services (Slack 2005: 326). Furthermore, services are also alleged to bring customer loyalty to the stage where the customer may become dependent on service suppliers (Vandermerwe & Rada 1988: 319). Also, services have a tendency to cause repeat-sale by making contact with the customer more effectively, and

thus the supplier can be in the right place to offer other services or products (Malleret 2006: 107). In conclusion, by providing services, companies get information about the needs of their customers which enables the development of customised offerings (Baines et al. 2008: 558).

Environmental benefits

Nowadays, manufacturing companies are increasingly 'greening' their supply chains and production which is reflected as growing commitment to sustainable business and corporate social responsibility. Over the last decade, reputation of many companies has been jeopardised due to a failure to fulfil corporate social responsibility and environmental guidelines, which has caused a significant decrease in satisfaction of different stakeholders such as workers, consumers, communities and shareholders. (Doni et al. 2019: 369.) The environmental literature has identified servitization as a route to improve environmental impact alongside with the discussions in the literature of management and economics (Goedkoop et al. 1999: 15). The key dissertation is the possibility to reduce the harmful environmental impact of products if customers review their concepts of ownership and companies change their business models (Neely 2008: 105). As a conclusion, servitization has influence on reducing the ecological impact of product usability and providing incentives for companies by increasing their value-adding features through extending the product's life-cycle (Doni et al. 2019: 369).

Customer's benefits

Customers are expecting to receive satisfactory delivery of the core service especially when they have developed a relationship with the service business provider (e.g. regular customers of a car service expect that their cars are repaired reliably). However, as a result of long-term relationships with the service provider the customers are also expected to receive benefits that are distinct from the core service performance. In the literature of services and relationships, it has been discovered that relational benefits can be categorised into four different benefit types: social, confidence, economic and special treatment benefits, as shown in Table 8 (Gwinner et al. 1998: 101–102.)

Benefit	Explanation
Social	"Customers get social benefits from long-term relationships with service companies"
	"Social benefits include friendship, relationship, feelings of familiarity, social support and personal recognition"
	"Common in services that include continuous personal contact between employees and customers"
Confidence	"The key outcome of relationship with service provider is risk reduction"
	"Comfort or feeling of security are reasons why customers develop a relationship with service provider"
Economic	"The primary motivation for exchanging relationships is money savings"
	"Economic benefits are associated with price breaks or discounts for customers who have developed relationships with the organization"
	"The fundamental axiom of relationship marketing is or should be that consumers like to reduce choices by engaging in an ongoing loyalty relationship with marketers"
Special treatment	"Rewarding customers loyalty with special treatment is proposed to be handled with "core service upgrading" and "service augmentation"
	"Relationship developed customers may receive additional services that are not normally offered to non-regular customers"
	"Some kind history development with a specific provider relates to customization"

Table 8. Customer benefits as a result of long-term relationships with a service provider.

In the long run, the core service is essential to remain in the competition. However, around these core service features there is a tendency to build marketing strategies. In addition to core service features, it is important to provide other benefits for long-term relationship customers. Furthermore, if customers get important relational benefits they may stay in the relationship even if they consider the features of the core service less exclusive. As a conclusion, it is suggested that loyalty, strategies and customer satisfaction can be built around relational benefits. (Gwinner et al. 1998: 110.)

5. CHALLENGES ASSOCIATED WITH SERVITIZATION

The servitization of manufacturing can be a tempting strategy to achieve higher revenue, profitability, stability, customer intimacy and growth, but it also has its own challenges. Vandermerwe and Rada's (1988: 314–315) preliminary research of know-how increased demonstration of how servitization can be useful strategy for manufacturers who are struggling with rising production costs and price competition. They also expressed concern on unawareness of how far manufacturers should go with services, for example what the optimal scale of service that should be offered is. Afterwards, research has shown that the decision on the scope of the service offering is not the only challenge. However, the main problem seems to be combining services and products into offerings, which requires integration within the organisation between internal functions and close collaboration between customers and suppliers. (Martinez et al. 2010: 464–465.)

The literature recognises that servitization of manufacturing poses major challenges although it is presented as a serious opportunity to accomplish competitive advantage (Turunen 2013: 12–13). The servitization of manufacturing can be considered as a change of offering to outside, but inside the organisation the change in offering is a result of bigger changes that are implemented. In order to adopt an appropriate resource allocation and organisational arrangements, managers in charge must be aware of required internal changes at the strategic and operational level. Commonly, companies that have started their transition in practice have acknowledged that the transformation from products to services and towards to solutions is a quite slow and complex process. (Turunen 2013: 13; Oliva & Kallenberg 2003: 161.)

To ensure readiness to operate when the service providing begins, manufacturers might need to reconstruct organisations and create service-oriented models. Industrial manufacturers experience transition from products to services as a difficult process to adapt, because it influences many issues such as organisational structures and culture, corporate strategy, product-service design, and customer relationships, which all might include resistance from customers and inside the company (e.g. Baines et al. 2008; Gebauer et al.

2006; Martinez et al. 2010; Neu & Brown 2008; Oliva & Kallenberg 2003; Vandermerwe & Rada 1988; Wise & Baumgartner 1999; Slack 2005).

The key element of success is to find the right people for the service dimension to create a service-oriented environment. Managers of companies must be convinced of that people are their most important asset in order to provide services. (Baines et al. 2008: 559.) The culture between service and traditional manufacturing is different and changing the mind-set of companies is required to prioritise services and their development over traditional competitive advantage sources (Mathieu 2001a: 51–52; Oliva & Kallenberg 2003: 166; Slack 2005: 327). However, to accomplish this important change, long-standing practices and attitudes are required (Vandermerwe & Rada 1988: 315–316).

The following chapters discuss the main challenges of transition to service business (see Table 9). The transition includes defining a service strategy, building organisational structure, designing market-oriented service, creating optimal service offering, transforming organisational culture and managing knowledge and communication.

Challenge	Author (year)
1. Defining a service strategy	"Service strategy means moving to the end of the production chain, towards the customer, and paying more attention to the end user to get know them better" (Vandermerwe & Rada 1988)
	"Selecting applicable service strategy depends on the competitive intensity of the market, the conditions in the business environment, the complexity of the customer needs, and the position in the value chain of the company" (Gebauer et al. 2010)
	"Fit of strategy' and organisational alignment of the organisation with strategy whereby organisational performance depends on suitable alignment with the three following factors: environment, strategy and organisational design" (Neu and Brown 2005; Gebauer et al. 2010a)
2. Building organisational structure	"Integrating or separating service business units" (Gebauer et al. 2009; Oliva & Kalleneberg 2003, Brax & Johansson 2009, Neu & Brown 2008)
	"Building service network and decentralised decision-making authority (Mathieu 2001b; Neu & Brown 2005)
	"Managers ability to design configuration of organizational elements affects on expected returns of service business" (Neu & Brown 2008)
3. Market-oriented service design	"Key strategic feature are market orientation and customer understanding" (de Brentani 2001; Neu and Brown 2005)
	"With new radical innovations, the company can be one step ahead and conquer new markets and customers" (Berg et al. 2014)
	"In service development, important stages of co-production are idea generation and screening, cross-functional group formation" (Grönroos 2008)
4. Creating optimal service offering	"Service offering classification" (Kotler 2003; Mathieu 2001a)
	"The success of value creation depends on the ability of both the customer and the supplier to observe and define the value" (Windahl and Lakemond 2006; Gebauer et al. 2006)
	"Creating a service portfolio" (Ojasalo & Ojasalo 2008)
5. Transforming organisational culture	"Convey importance organisational culture and impact of service strategy to all levels of the organisation" (Bowen et al. 1989; Homberg et al. 2003; Brax 2005; Gebauer et al. 2006)
	"Transition of business mindset" (Mathieu 2001a, b; Oliva and Kallenberg 2003; Slack 2005; Neu and Brown 2008)
	"Significant changes in attitudes and long-standing practices will be required as well as changing from product-centric structure to more customer-centric" (Vandermerwe and Rada 1989; Windahl and Lakemond 2006).
6. Managing service knowledge and communication	"Knowledge sharing and promoting intrafirm collaboration" (Neu & Brown 2005; de Brentani 1990; Gebauer et al. 2008)
	"New service development enabled by innovative climate" (de Brentani 2001; Gebauer et al. 2008c)
	"Internal and external communication most important factors in transition to services" (Windahl & Lakemond 2006; Grönroos 1998)

Table 9. Challenges in servitization (Adapted from Kinnunen & Turunen 2012: 60; Kinnunen 2011: 13–14).

5.1. Defining a service strategy

Industrial companies have to adapt the required organisational structures and processes if they decide to follow a service-oriented strategy (e.g. Mathieu 2001b; Gebauer & Friedli 2005; Oliva & Kallenberg 2003; Gebauer & Fleisch 2007). The main challenge in this is to define an organisational strategy that delivers required combination of products and services which support customer loyalty (Wise & Baumgartner 1999: 136). The organisation must value services and service orientation to be able to adopt a downstream position such as the delivering services of installed base (Oliva & Kallenberg 2003: 166–167). Therefore, same organisations tend to be customer oriented by providing solutions with

product service combinations and customised outcomes that are tailored to specific capabilities and customer needs (Baines et al. 2008: 560). Windahl et al. (2004: 220) also emphasise the importance of customer relationships and expanded expertise in providing integrated solutions.

According to Gebauer et al. (2006: 381), servitization is a strategy that aims through service offering to differentiation from competitors. One of the claimed reasons to servitize is increasing price competition and changing competitive dynamics of the market. Therefore, an important question is "Does service strategy form new competitive advantage for manufacturers?" (Vandermerwe & Rada 1988: 321–322). When servitizing, creating a strategic plan for service provision is essential as it encourages decision-makers in the organisation to take the necessary steps in forming organisational preparations and resource investments (Gebauer et al. 2006: 379). (See also, Kinnunen & Turunen 2012: 61.)

Gebauer et al. (2010a: 202) argued that selecting the applicable service strategy depends on the competitive intensity of the market, the conditions in the business environment, the complexity of the customer needs, and the position in the value chain of the company. However, this strategic change may have wider implications, e.g. competitive environment of the market may change when manufacturers move towards services (Turunen 2013: 19). Service companies and traditional manufacturers have partly overlapping offers, which means that companies are competing with new and unusual rivals (Vandermerwe & Rada 1988: 321–322). For this reason, it is critical to carefully choose a strategy that does not interfere with the ability of the manufacturer to perform in the product business. The aim of servitization in most cases is after all to complement product business instead of complicating it. (Turunen 2013: 19.)

Manufacturing companies often understand that they need to get more information about their competitors to be able to offer a more comprehensive portfolio of services, since the service business sometimes requires companies to approach new customer segments (Vandermerwe & Rada 1988: 321–322). The formation of a service strategy is based on the acquisition of internal and external data, on sharing this information inside the company, and utilisation of it for the company's benefit (Neu & Brown 2005: 13). A service

strategy means moving to the end of the production chain, towards the customer, and paying more attention on the end user to get to know them better (Vandermerwe & Rada 1988: 318).

There are several suggestions for service strategies presented in the literature (e.g. Mathieu 2001a; Gebauer et al. 2008). The strategies differ in the type of customer relationship and importance of services in offering which are considered as the service strategy's most important design elements (Kinnunen & Turunen 2012: 61). According to Gebauer et al. (2008a), service strategies can be divided into four types: after-sales service strategy, customer-support service strategy, outsourcing partner, and development partner. A development partner's services offer their customers process performance while an outsourcing partner's aim is to adopt all responsibility of the customer's business (Gebauer et al., 2007b: 15, 18). In order to gain a competitive advantage, manufacturing companies must move towards the strategic position of a customer-support service provider, a development partner or an outsourcing partner since the service strategies are dynamic and should change over time (Gebauer et al. 2010a: 201–202). (See also, Kinnunen & Turunen 2012: 61.)

Deciding on the applicable service strategy is not enough for manufacturing companies that want to expand their service offering. Hence, expanding the service offering is not just about adding the services to the customer's package, because the most difficult challenge is the implementation of internal changes within the company. According to the latest studies, focus has been on 'fit of strategy' and organisational alignment of the organisation with strategy whereby organisational performance depends on suitable alignment with the three following factors: environment, strategy and organisational design. (Neu & Brown 2005: 4; Gebauer et al. 2010a: 203.) (See also, Kinnunen & Turunen 2012: 62.)

In servitization the requirement for the top management is to find ways to include services in the overall competitive strategy and analysis, and strategy design which has been considered as an unprofitable necessity (Vandermerwe & Rada, 1988: 322). Furthermore, Gebauer et al. (2006: 381) point out that services in manufacturing companies have first

been noticed as add-ons and functioned as a deliberate strategy only when the purpose has been to increase total value creation. Also, the implementation of the strategy must be monitored when adding services in the strategy. Gebauer et al. (2006: 381.) In order to match the new organisational situation with the new strategy there are requirements that need to be met, such as creation of ability to provide services, training employees, service-oriented mindset and development of a new organisational culture to a certain extent (Gebauer et al. 2010b: 122).

The service strategy must be modified to suit the changing competitive strategy since it is never a permanent state. Manufacturing companies' first challenge is to develop a service strategy in the transition process, which requires review on the company's current organisation structure, service development operations, human resource management and organisational culture. (Gebauer et al. 2010a: 202.)

5.2. Building organisational structure

Companies must identify issues such as organisational structure and position on the value chain when developing service business. A service delivery system's characteristics are completely different from those of a production system (Baines & Lightfoot 2013: 104). Service development structural design is a key factor to achieve successful outcomes of servitization. Providing advanced services is a move that generally affects cross-functional structures and involves important decisions regarding the physical aspects of the delivery system such as capacity, facilities, equipment, and technology. Managers who are considering such a move must take into account the current structure of the company's business operations and decide how to integrate the service operations. Companies have identified a number of approaches to these issues such as:

- "Create a new business function to oversee all service responsibilities"
- "Create a new business function to handle specific services (typically, advanced services) while integrating other services into existing business functions"
- "Allow service operations run in parallel with existing structures, with a single functional structure managing both products and services"

- "Outsource some services and allow an internal business function to manage the others." (Bustinza et al. 2015: 54–55.)

In the servitization process of manufacturing companies the structural challenge is related to organising the responsibilities of strategic business units (SBU), in other words, should service and product SBUs be integrated or not (e.g. Brax & Jonsson 2009; Gebauer et al. 2009; Neu & Brown 2008; Oliva & Kallenberg 2003). The key structural issues of servitizing companies have been distinguished as building a service network and a decentralised decision-making authority (Mathieu 2001b; Neu & Brown 2005). All previously mentioned structural issues should be considered to endorse the service-oriented culture and to align organisational structure with the new strategy. In addition, managers in manufacturing companies will realise that their ability to design configuration of organisational elements that is suitable for external business environment affects to expected returns of the service business. (Neu & Brown 2008: 234.)

According to Oliva and Kallenberg (2003: 166–167), the integration of service business is a degree that is handled in a distinct business unit including corresponding profit and loss responsibility. Gebauer et al. (2010c: 241) confirmed that "*Separating services from the product business means that firms create a distinct SBU for services that fully control the targeting of customers and the development, pricing, selling, and delivery of service offerings. As the distinctive SBU, the service organisation takes over the financial responsibilities for profit-and-loss in the service business."* In general, separate service organisations have been considered as more successful than integrated service organisations. However, it is still unclear due to research limitations whether this success is related to service organisations managerial effort or cultural and managerial prejudices which constrain efforts of service development. (Oliva & Kallenberg 2003; Ojasalo & Ojasalo 2008.) In any case, there are several findings which support the foundation of a separate business unit for services. The companies that have increased service revenue have been identified as decentralised service organisations which have responsibility of profit-and-loss meaning that the measurement of profitability becomes easier as well. (Gebauer et al. 2006: 378.)

Decision-making is one of the structural challenges that companies have to consider. Hierarchical decision-making is emphasised by traditional product-oriented cultures. Forming business-to-business services in goods-dominant companies requires senior level managers to allocate a high degree of decision-making authority for strategy formation such as the value proposition and marketing strategies to organisations' lower level managers. Also, it is claimed that vertically decentralised decision making is one suitable way to develop customer- and service-orientation since lower level managers are closer to customers and considered to have better understanding of customers' demanding services. (Neu & Brown 2005: 12.)

The creation of a service network is identified as manufacturers' structural challenge in transitioning to service business. According to Mathieu (2001b: 457–458), service providers could help customers to gain global competitiveness with the use of their product services and know-how. A company that owns a global service organisation has a competitive advantage when customers around the world require local presence (Neu & Brown 2008: 238–239). In turn, substantial investments are required when building a service network, which is why it should be carefully considered, although important market information from local service organisations could be gained (Gebauer et al. 2007b: 17–18).

5.3. Designing market-oriented service

Long-term success requires continuous improvement of existing products and services from companies. Companies must be able to react to changes in the operating environment by developing new products, services, or business models. With new radical innovations, a company can be one step ahead and conquer new markets and customers. (Berg et al. 2014: 14.) The core of the service activity is the value that the customer experiences in the service process. Therefore, the problem with an efficient service organisation is that productivity and the value that the customer experiences are interrelated. This creates a dilemma for service processes. Internal efficiency resulting from cost-effective solutions does not necessarily lead to better financial results. However, if the organisation has

been strongly product-oriented and focused mostly on technological and internal processes the transitions to offering services and developing market-oriented services can be challenging. (Grönroos 2007: 9.)

In general, services are inaccurate and difficult to define which makes the design of services substantially different (Slack 2005: 328). According to Grönroos (2007: 63–64), services are an add-on to the customer's value processes which makes the service process completely different from the product process. Therefore, this can be a preventing factor for companies that want to expand their service business, especially because they have to take into consideration competition outside of their business area from surprising competitors such as their own suppliers, distributors, and customers (Vandermerwe & Rada 1988; Mathieu 2001b; Oliva & Kallenberg 2003). The design process must also take into consideration the risk of activities that were earlier performed by customers since they may pose new challenges. In this case, the margin risk may be higher than the increased profitability. (Slack 2005: 328.) The design of service provision must also take into consideration the focus on communication strategies that describe the value proposition to the customer (Mathieu 2001a: 52).

It has been acknowledged among the scholars of servitization that company managers should create a process for the idea creation where the new services can be tested together with front-line employees and customers (de Brentani 1995). In service development, important stages of co-production are idea generation and screening, and cross-functional group formation (Grönroos 2008: 306–307). Developing successful new services through using structured service development process consists of the identification of market needs, conceptualisation and experimentation of the idea, and providing market introduction (Gebauer et al. 2006: 383–385).

In order to develop services successfully, many recognised researchers in the industry emphasise the importance of developing market-oriented services (Brax 2005, de Brentani 2001; Gebauer 2007; Oliva & Kallenberg 2003). Market orientation and customer understanding are essential for companies and a key strategic feature for successful business-to-business services (de Brentani 2001; Neu & Brown 2005).

5.4. Creating optimal service offering

Adding services to offerings is certainly the most obvious and visible manifestation of servitization for the supplier and the customers. However, it has been realised that there are wider consequences of adding services to the portfolio. (Turunen 2013: 14.) In this thesis, service offering is considered as a result of deeper internal changes that have occurred in the strategy, organisational structure and market-oriented service development. Thus, it was proposed that the analysis of service categorisations (service portfolio) helps companies to develop a service strategy and to decide the scope of the services to be provided, also in the case of industrial services (Ojasalo & Ojasalo 2008: 26–27). The versatility and scope of industrial services have increased during the years of development and it has been found that the type of service effects on the managerial practice. Hence, it is more about carefully deciding what types of services to offer rather than the quantity of the services. (Mathieu 2001b: 463–464.)

There are some service offerings classifications that are founded on purchase phases and product features. According to Kotler (2003), industrial services are divided into two wide categories, which are business advisory services and maintenance and repair services. Here, business advisory services are considered as services that facilitate the development or management and the use of a product. On the other hand, Mathieu (2001a: 42) divides services into three groups: customer service, product service, and service products. Customer service can be for example technical support provided in the case of customer inquiries which is sometimes free of charge. Repair and maintenance are examples of product services which are directly related to the service provider’s own products. Finally, service products include different services of any product or brand. In other words, this means that the company begins to provide services for customers who have purchased competitors' products (e.g. process optimisation). (Mathieu 2001a: 42.) The Finnish elevator company KONE is an example of this kind of service provider that offers a wide range of different services to products of other manufacturers (Turunen 2013: 15).

On the other hand, Penttinen and Palmer (2007: 553) debate on creating a type of relationship between the buyer and the seller by more extensively dividing services into relational and transactional services. In this context, companies that change their strategy from offering basic components to provision of integrated solutions resign transaction-based customer relationships and establish a relative customer relationships instead. This kind of classification finds that customer satisfaction is not maximised by providing a generic, undifferentiated service to all segments and visualises the idea of customisation. (Turunen 2013: 15.)

The extension of the service offering by beginning with product-related services and continuing with services directly supporting the customer is one way to succeed in increasing service revenue (Oliva & Kallenberg 2003: 160). The industrial services offered by manufacturers aim to promote the end-user process, which has the same purpose as emphasised in the 'service supporting the client's actions' category. The purpose of this is to help a customer to maximise all the processes, actions and strategies related to the product. (Mathieu 2001a: 39–40.) Accordingly, the expansion of the service offering can be seen as a change in the customer's value proposition from production efficiency to the end user to product's efficiency in the customer process (Gebauer et al. 2006: 380). The success of the value creation depends on the ability of both the customer and the supplier to observe and define the value. The supplier plays an important role and needs to communicate, suggest, show and organise training in determining the value together with the customer (Turunen 2013: 16).

The utmost important factors in servitization are creation of a service offering that is in line with the organisation's strategy and awareness of the customer's needs. It is obvious that companies cannot serve all customers and thus, a strategic decision on the provision of service offering is needed. The decision on the positioning of the offering can be a difficult task since servitizing companies might not have explored and tested all the possibilities that services can provide. (Turunen 2013: 17.)

5.5. Transforming organisational culture

Service-oriented culture is defined as an organisational culture in which the quality of service is the guiding value and philosophy that is passed on to customers through employee activity (Schneider & Bowen 1995: 236). Schneider and Bowen also state that an organisation has a service-oriented culture if "employees believe that customers deserve excellence" and if different functions work together to achieve this excellence. According to Gebauer et al. (2010c: 239–240), service-oriented culture consists of four elements in manufacturing companies: service orientation of both management and employee values, and of both management and employee behaviour. Thus, a company's corporate culture and human resource management requires changes when company is becoming more service-oriented, especially in industrial marketing companies (Homburg et al. 2003: 1–3). (See also, Kinnunen & Turunen 2012: 62.)

Changing the existing product-oriented organisational culture or building a new one is fundamentally strategic change that requires special attention from the entire company (Brax 2005: 151–152). The attempt to transform a traditional manufacturing company to the desired organisational strategy brings up specific challenges. The traditional manufacturing culture is different than the service culture which is more detailed, and the transition of business mindset is required to implement services and to prioritise their development in terms of more traditional sources of competitive advantage (Oliva & Kallenberg 2003: 167; Slack, 2005: 328). Significant changes in attitudes and long-standing practices will be required as well as changing from product-centric structure to a more customer-centric one (Vandermerwe & Rada 1988: 315–316).

Companies face often resistance from the areas of the organisation where the service strategy is not fully understood or where it is feared that it will cause a change in infrastructure (Mathieu, 2001b: 465). The key to success is finding the right people for the service dimension and creating service-oriented environment (Baines et al. 2008: 559). Company managers need to be convinced that people are their most important asset in providing services which is, in fact, the most important change needed when moving from manufacturing to service culture (Mathieu, 2001b). In addition, service culture is a factor

that creates competitive advantage, enhances the performance and is difficult to imitate (Baines et al. 2008: 559).

Since companies have capital invested in production, facilities, machinery and materials, it is common to note that the company remains product-focused as it must be capable to perform the product business in parallel. Hence, companies' management has difficult challenge in maintaining the problematic relationship between two cultures in one organisation. (Turunen 2013: 23.) One a way to control the potential change resistance is to keep both sets of values, rather than replacing one with another (Gebauer et al. 2006: 382). Companies that have traditionally been product-oriented and want to become service-oriented should hire and reward employees who are capable of handling the new challenges the services require. Also, it has been claimed that customer orientation should be included in managerial positions in order to integrate the service strategy and culture with existing culture. (Turunen 2013: 23.) Leading service orientation from the managerial level to the employee level is an essential part of a manager's actions (Gebauer et al. 2010c: 253). Service orientation is not transferred to the level of employees if supervisors do not use enough time and resources to put workers under regulatory pressure to understand the value of the services and to handle difficult situations. (Turunen 2013: 23.)

A manufacturing company must take into consideration both cultural and strategic change in the organisation in order to be able to start servitizing. Servitization is more about perceiving the offering which means providing value to customer instead of just adding services to the offering. Building a relationship with the customers and gaining information that may open new market and opportunities that benefit both the supplier and the customer are enabled by creating service-oriented culture.

5.6. Managing service knowledge and communication

Two important factors when building a service-oriented culture are knowledge management and communication. This can be achieved with the change of employee mind-sets where employees get better understanding of services' customer benefits with internal

marketing strategy. (Grönroos 1998: 333.) Building an organisational culture that considers the transition to services as a positive challenge is related to internal marketing (Gebauer et al. 2006: 380). External communication which aims to deliver and maintain a positive corporate image is also considered as a challenge in transition to offering services. Manufacturing companies aim to change customer perception with providing excellent services, selling high quality products and fulfilling customer requirements and these are all handled via external communication. Therefore, describing the customer value proposition requires communication strategies. (Mathieu 2001a: 52.)

Internal and external communication are highlighted by scholars as some of the most important factors for manufacturing companies that enable transition to services (e.g. Grönroos 1998, Gebauer et al. 2006). Integrating business unit responsibilities and promoting intrafirm collaboration is essential for achieving a position where the company's strategy is aligned with the market requirements (Neu & Brown 2005: 5). Manufacturing companies that have succeed in implementing a service strategy have used incentive systems for achieving goals which in turn were used as an employee motivator (Gebauer et al. 2006: 382). Also, service organisations have noticed that use and coordination of different methods is required in order to measure the performance (Gebauer et al. 2006: 378).

Empowerment of the service personnel and continuous communication between the customers and service workers are considered as the key requirements in the transition to a service provider. Manufacturing companies can improve their imago in solution business with establishing a status of interdependence and enhancing trustworthiness. Therefore, the foundation of servitization is communication which is considered as an essential tool to build customer relationships. Also, measurable and well-defined promises should be included in communication towards customers. (Brax & Jonsson 2009: 552–556.)

6. FINDINGS

This chapter summarises the findings of the theme interviews and surveys.

6.1. Findings of theme interviews

All three theme interviews were conducted in April 2019. Each interview lasted around one hour. The interview questions were sent to the interviewees by email 1–2 weeks before the interview. All the interviews started with short presentation of the case company and the objectives of this research. Hereafter, the interview was conducted according to the order of Annex 1.

In the following sub-sections, the findings of the theme interviews are presented.

6.1.1. Present services in the companies

What kind of services does the company offer at the moment?

The interviewed companies provide their customers services related to the new equipment business (e.g. installation and commissioning services), maintenance services (various maintenance, modernisation, inspection, spare parts and security / fault services) and advanced services (digitalisation). In all companies, the service business represents a significant share of their net sales.

Which of your services are productised?

According to the interviewees, all the services provided by the companies are productised and documented or at least that is their aim. Each service has its own product description, product card and accurate content definition. The companies have carefully considered the content and scope of the services, monitoring and reporting, and have developed sale support configuration tools that can be used when creating new service packages.

One of the companies clarified that: "*In order to be able to maintain adequate invoicing rate in service business the whole chain has to be carefully considered in advance, meaning that strict criteria is required on what is included in the contract and what is not*". From the customer perspective this enables the company to provide customers accurate reports on what was agreed to be done and what has been done. Even though, careful productization is the main rule, the company admits that there is sometimes a need for exceptions. For example, important customer may have some equipment from another manufacturer in their premises that the company would not like to maintain but if the customer is important enough, they may still include the maintenance of this equipment in their service contract.

Do you have services that are tailored for a customer's specific needs?

All the interviewees confirmed that each service package is always tailored for the needs of the customers. However, the point is to compile a suitable service package of ready-made pieces. There is always discussion with each customer on whether they have something special that needs to be considered and included in the service package. According to all three companies, there is always need for some kind of customisation when creating a service package for a customer. Two companies have been facing challenges in the customisation of their services and they admit that most of their services still has been considered too much from technical, service technician or SAP point of view, or with 'inside-out' thinking, and they are working hard to understand what is that the customers truly need. Another company said that they have not yet made proper service segmentation based on customer behavior and still rely extensively on 'one size fits all' thinking. According to this company, the digitalisation in which they will invest more in the future, enables them to recognise customer behavior profiles that can be used when making services more customer-oriented. On the basis of the answers, it can be concluded that all three companies consider customisation of services as an important factor in which they try to improve in the future. However, the customisation is an endless job which requires a lot of work from companies. At the customer interface, sales representatives play an important role in identifying customer needs and collecting 'quiet' information.

Do you have 'free' services?

All three companies confirmed that they are trying to avoid 'free' services for cost reasons. Also, business structure of the companies (business area division) is designed so that it directs services related to the delivery of a device (e.g. installation services) separately from maintenance services. According to one of the interviewees: "*If we start offering maintenance services together with equipment trade, there is always the risk that in the final negotiations the maintenance service package will need to be given as a free complementary item with the equipment. This would slightly dilute, not only the price of the maintenance services but also their appreciation in the customer's eyes, and this we don't want at all*". One company admitted that they have made a mistake in the past when they offered certain services for free to their customers in order to increase competitiveness and equipment sales. Afterwards, it is more difficult to start billing for the same service, even though the service adds value and customers would probably pay for it nowadays.

Do you have a separate unit for the service business or is it a part of another unit?

The service business forms its own independent business area in all the three companies. The interviewees recommended to separate service business from equipment sale because it forces to determine service business metrics, personnel incentives, managerial focus and employee engagement methods from the service point of view, as well as in order to consider different 'clock speed' in equipment sale and maintenance business.

How do you follow your service business efficiency and profitability?

All three companies have invested a lot in the service business monitoring. Nowadays monitoring efficiency and profitability is highly advanced. The companies apply several KPIs to measure overall sales, profitability (e.g. cross margin), staff turnover, utilisation rate and response rate. They also have real-time reporting tools for monitoring operational and internal accounting. For example, the work of service technicians is fully digitalised in all the companies: the technicians report in real time what they are doing and when

they start and stop a certain job. This way, billing is also handled automatically. The completed job is reported in the maintenance ERP (Enterprise Resource Planning), which is also actively monitored. In one company, the meters are divided into customer meters, service meters, efficiency indicators and cost meters. The company has sufficient data continuously available and the data is monitored on a weekly basis.

What kind of services will the company offer in the future?

Technology enables many new things. In the recent years, the role of automation and digitalisation has remarkably increased in the products of all three companies. All the time more and more analytics, sensors and data will be available for businesses' use. In the future, the companies will increasingly move to collecting real-time data and related analytics. At the moment, the companies are trying to use the digitalisation in their field functions more efficiently. Nowadays, companies serve their customers through remote connection in problem situations. For example, when service technician leaves for an emergency call, the company expert is already connected in the device with remote connection and drives basic diagnostics. This saves time and costs when the right material and know-how can be brought to the right place at once. This way, the duration of the disruption experienced by the customer is also minimised. Furthermore, the material flows can be simulated, and improvements can be suggested to the customer's processes with a help of different simulation models by utilising real-time data. The future direction of one company is 'network as a service', where they sell performance instead of products, such as a certain number of machine lifts instead of equipment. The idea is to significantly increase the sale of spare parts and services. According to the company's calculations, the life time value (potential profit) of a device sold could be doubled this way. The representative of one company mentions that the environmental aspects have also recently increased. However, it is still unclear whether customers are willing to pay for environmental friendliness and another question is how much.

6.1.2. The role of service business in the company

What is the role of industrial maintenance services in the company's current business?

In all the companies, the role of the maintenance business is very central and strategic. Maintenance business accounted for about one third of the turnover of all three companies. According to one of the companies: "*The beauty of the service business is that it is not so cyclical, one way to motivate the company management to focus and spend money on service business development is to build a service business model that covers all of the firm's fixed costs. It should be the first goal in the development of the service business, because this way the company will achieve the point where the business would be on a healthy basis even in a slump. On the other hand, if there is no service business on the side, then adjustment actions might be needed according to the business cycle*".

Do you see your company as a machine supplier, solution provider, maintenance partner, performance partner or value partner? Why?

All three companies replied that they had started with the 'machine supplier' role and are now in the role of 'solution provider' or 'maintenance partner'. One of the companies considers itself already as 'performance provider' that, according to the company representative, means that the company knows how customer's construction logistics works, what kind of solutions they might need and what kind of maintenance would be useful during the construction period. All the companies confirmed that 'value partner' role is their goal. One of the companies' maintenance service range is wide, which provided difficulties to choose the current role of service business: they have customer relationships and geographic areas where the company is closer to the bottom left, i.e. the 'machine supplier', and on the other hand, they have relationships where they are in the role of 'value partner' where customers' own processes are highly dependent on the company's equipment and maintenance services.

What kind of changes are needed in the company in order to achieve solution provider or higher role in the service business?

The goal of all the companies was to achieve the role of a 'value partner' in their service business but each company had a different view on how it can be achieved. One company feels that measuring performance and transforming this achieved benefit into a quantitative proof would help them to move towards 'value partner' role: "*The best way is if we can show customers what their cost level has been before and how low their cost level would be in the future with the benefit of our services. The digitalisation enables us to collect real-time data which makes it possible to monitor performance and conduct needed analysis to illustrate the benefits to the customers*". On the other hand, one company sees that they are still too B2B-type organisation and they would like to provide to their customers data about the end-user's behavior. They brainstorm ideas such us whether the information provided by their IoT-solutions elevator utilisation rate could be processed to such form that the customers could use it to optimise for example their cleaning services.

Do you see the service business as a key part of your business strategy in the future?

All companies agreed that the service business will be a key part of their strategy in the future.

6.1.3. Servitization process

What have been the most important steps in the development of the company's service business to date?

All the companies shared the opinion that the biggest and most important step was taken right after the company was established, i.e. when it was decided to start the service business and set up a separate business unit with its own management and dedicated maintenance staff. This made it possible for the companies to strategically focus on producing, marketing and selling services. The portfolio of digital tools for service business's needs

was born through evolution. This way, the companies have developed their understanding of the service business, which is ‘spin-off’ type of business, and is clearly different from the equipment sales. According to the companies, the focus of the service business should be in long-term customer relationships, perseverance and understanding of customer needs. The representative of one company stressed that suggesting the next steps to the customer is especially important when a service technician performs maintenance activities at a customer’s site. One of the companies estimates that customisation of customer communication and its channels will be the next milestone in the 2020s.

Where and how have you started?

All three companies confirmed that they have been in service business throughout the company’s history. According to them, it all started by selling services by side of equipment sale: “*The importance of maintenance services is emphasized when selling consumables and devices which are in continuous use, otherwise the company would not be able to operate*”. The global service network is also an important competitive advantage for the companies.

How have you developed the service business processes internally within the company and externally with the customers?

All three companies are constantly developing their internal and external service business processes. Among others, the following internal processes have been developed: sale development (e.g. own sale resources for the maintenance business), availability processes (improvement of delivery times), back office functions, description and documentation of all maintenance processes, and collaboration inside the organisation between sellers, installers and service managers. In addition, companies have developed digital tools to support previously mentioned processes, which has made the service business more efficient. External development targets have been: real-time reporting of completed work to the customer, collaboration with property managers or other partners, and customer communication and partnership.

What is your company's market share in the service business where you operate?

All three companies have a significant market share in both domestic and export markets. According to one company, determining the total market share is a bit challenging as many customer companies have their own internal maintenance organisation, which usually means that external maintenance services are not purchased. With respect to these cases, as an external service provider you need to think about different consulting solutions to get something from this particular market.

What are the benefits of the service business?

The companies listed the following benefits of the service business: financial significance, stabilises cyclical fluctuations, strengthens customer relationships on a long-term basis, the company might detect new business opportunities on an early stage e.g. information about customers' future plans from customer contacts and service technicians, the global service network provides competitive advantage e.g. in sales of new equipment, good knowledge of different manufacturers' equipment and learning 'product life cycle' type of thinking.

6.1.4. Challenges of the servitization process

What challenges has the company encountered when transforming from a machine supplier to a service provider?

The companies listed the following challenges in the transformation process from machine supplier to service provider: changing the way people think and behave (e.g. making the salesmen understand that they are selling benefit and advantage instead of devices), internal communication and implementation of service culture, creation of sales value (e.g. peace of mind and functionality) and communication with the customer, staff availability and turnover. All the interviewees stated that their business would not be able to operate without the service business and that they are doing everything to keep developing it.

Which so-called success factors have contributed the most to the success of the company's service business?

The following service business success factors were mentioned by the companies: long experience in the service business, separating service business into its own business area, quality of products and the reliability gained through them, global service network, capability to operate fast, decision to exploit digitalisation, market leadership, customisation of service offering according to customer needs (contract coverage), spare parts as a part of service business, productisation and documentation of services, segmentation of customer needs based on customer behavior and customer centric way of thinking, measuring service business efficiency and profitability with different KPIs, and continuous improvement of service business.

Have you defined a service strategy?

All the companies have defined a service strategy in their annual report such as ‘life cycle in real time’ and related elements. The importance of the service strategy has become even more central due to the ongoing technological revolution.

Have you built an organisational structure around the service business? How?

All companies have built an organisational structure around the service business. The service business forms its own business area with its own management. In the companies, the maintenance business is clearly its own organisation and it is in line till ground level salesmen and service technicians. This means that each service salesman is part of the maintenance organisation and each device salesman is part of the equipment business all way to the customer interface.

How have you designed the services to fit the market?

The companies' all services are productised, standardised and designed to fit the market, taking into account market and technology factors as well as the company's own competence factors to the extent that not all service products are offered in all markets. The companies admit that they are not even able to provide all the services in all countries due to the limited technical capability in some locations. However, large training and development programs aim to harmonise country-specific differences by organising training sessions every year for service technicians and service managers, as well as for salesmen and sales management. One major challenge here is the large need for training since all the three companies provide services for equipment of different manufacturers which requires extensive expertise from service technicians around the world.

How have you developed an 'optimal' service offering?

According to the companies, the optimised service offering is always built individually for each client by 'putting together the puzzle pieces'. They see that the service portfolio changes all the time and it is never complete. Technology, legislation, or competitive situations can bring new opportunities and the companies must be constantly ready to develop their service offering accordingly.

How have you changed your corporate/organisational culture to service-oriented?

All the companies admitted that they still have work to do in transforming their corporate culture more service-minded. Companies also considered this as one of their biggest challenges. They emphasized that the company's culture should be suitable and as service-oriented as possible in order to move to the right direction in a big picture as well as on a daily basis as leaders cannot control everything in big organisations.

How do you manage knowledge and communication?

All the companies have focused on training programs that concentrate on know-how and business skill development. All the interviewees still saw needs and possibilities for development in their company's internal communication and they have been seeking for suitable digital solutions. They have identified especially linguistic challenges in internal communication of global maintenance organisation as well as the mobility of service technicians, which makes simultaneous communication difficult. They all emphasize the importance of communication as an important factor in any change and especially when building the corporate culture.

6.1.5. Tips for setting up a service business?

In the final question, an advice was asked from the interviewees for setting up a service business in the case company. All the interviewees advised to start with small, carefully planned, limited, timed and implemented activities. First, entities should be identified where the case company has sufficient capacity and competence to provide customer added value. In other words, the case company should realistically assess what business potential it has in the service business with the help of different analysis and in the light of installed bases. Service business can be started for example with deployment and installation services. In order to identify potential services, the case company would also need to investigate whether the potential customers have any statutory obligations that the services could respond to. In this case, the customer would not be served with a problem, but a solution to a problem that the customer would need to solve in any case.

One of the companies advised to concentrate, based on its own example, at the top level on three elements: service contract sales, repair service sales and productivity. In service contract sales, it is recommendable to monitor the following KPIs: number of equipment service, the initial value of the maintenance contract (monetary value), conversation rate i.e. how much of the new device business side can be converted to a service base and the breakdown of contract types i.e. whether only basic services or all services are sold

evenly. In repair sales, the most important KPIs are repair, call out and spare parts monetary value, especially if concentrating on basic service contracts. Predictive maintenance or modernisation services can be provided as part of repair services to improve product condition and reduce customer repair needs. Productivity is measured with variable costs per device, equipment in service per technician, feed time efficiency, which means how much time is spent on performing contract maintenance, job combination that has come with digitalisation and means how many drives can be combined with maintenance work in customer fault situations in order to yield productivity. The last piece introduced by this company is 'customer centricity' that focuses on communicating with the customer.

The representative of one company advised to start one market at time, starting from the most potential market, for example domestic market and gradually passing the service business to other countries. This way the case company will learn by doing what sells and what concept works. For example, responsibility could be used as a sales argument and directed to real estate and housing company board chairpersons who bear the statutory responsibility for the maintenance of civil defence shelters and at the same time stressing the severity of potential problem situations. Instead of maintenance service, the service could be sold to the customers in the form of insurance. In practice, it is about image marketing, i.e. selling a customer peace of mind. For relatively small price, customer could feel confident that the civil protection shelter is in a good order and that the customer has fulfilled its statutory duty which can also be proven if required. Since civil protection equipment does not affect and is not visible in the day-to-day life of its owners, such a marketing strategy would likely attract potential customers more effectively than traditional maintenance service marketing.

6.2. Findings of the surveys

The second part of the research pursued to identify the needs of the potential customers in the civil shelter maintenance business with surveys. Three different surveys were conducted based on the theory review of this study and the knowledge and experience of the case company's experts in service field. The surveys were directed to three different customer segments 1) residential building customers and property managers (see Annex 2),

2) construction companies and end users (see Annex 3), and 3) current case company's customers (see Annex 4).

Survey number one (Annex 2) was directed to the members of the Board of Directors of residential building and the property management companies. Survey one was shared in the Facebook group of property management association, the members of the Board of Directors of residential buildings, decision-making for property owners (PKO forum), and in the LinkedIn and Facebook profile of the case company. Survey number two (Annex 3) was sent to representatives of the construction companies and end users whose contact information was registered in the case company's database. Lastly, survey number three (Annex 4) was sent to the case company's current maintenance contract customers. Despite the extensive dissemination of the surveys, in total 23 replies were received from the survey 1, only 1 reply from the survey 2 and 3 replies from the survey 3. In general, the questionnaires were answered anonymously, but respondents were able to leave their contact information if they desired.

The results of survey one and their analysis are presented in the following. The number of the responses of surveys two and three was so small that presenting and analysing their results was considered unnecessary. In the following circular diagrams, all five questions and answer alternatives of survey one are presented separately. Circular diagrams show also how respondents' answers are distributed. The answers are used to find out what potential customers think about the maintenance services of civil shelter and what opportunities and benefits they could provide for the case company.

The first question was "Do you have a civil shelter in your property?" and the answer options were "Yes", "No" or "Not sure". The purpose of this question was to make sure that the survey was addressed to the right people whose property was protected with civil shelter. Based on the answers of the question one, seems that the survey was addressed to the right people since 96% of the respondents replied "Yes".

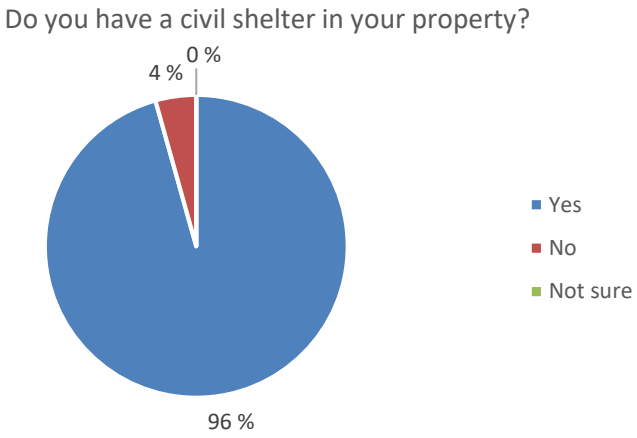

Figure 9. Breakdown of the replies to question one.

The second question was designed to find out how potential customers have currently organised the maintenance of their civil shelter. The answer options were “The housing company takes care of the maintenance itself”, “Annually by an external service provider (service contract or other service)” and “Civil shelter is not regularly maintained”. Based on the answers of the question two, it can be stated that almost half of the respondent’s civil shelters are not regularly or at all maintained. About half of the respondents maintain the civil shelter by their own and about one-eighth of respondents use an external service provider. On the basis of the answers to question two, it can be stated that there is potential for the case company in the civil shelter service business and the competition seems to be quite low at the moment.

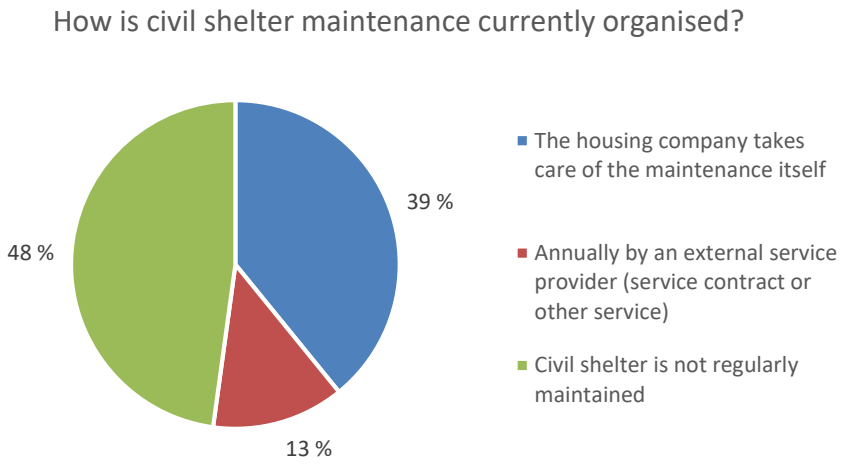

Figure 10. Breakdown of the replies toquestion two.

The third question was designed to clarify what kind of services potential customers would be interested in. The answer options to question “If available in the market, would you consider services where” were “to survey the current state of your civil shelter and the potential needs for repair and equipment upgrades”, “to provide inspections and maintenance of your civil shelter and to carry out the tightness test by professionals (the approved tightness inspection record is acceptable to the authorities as proof of the condition of the civil shelter)”, “to ensure that the civil shelter is kept in working order with a maintenance contract (approx. 30–50 €/month) which would enable it to be deployed as required by law (72h)” and “to train the care takers of civil shelter”. The respondents were given the option to choose between zero to four options in total. On the basis of the answers to question three, it can be stated that customers would be relatively equally interested in all the proposed civil shelter maintenance services.

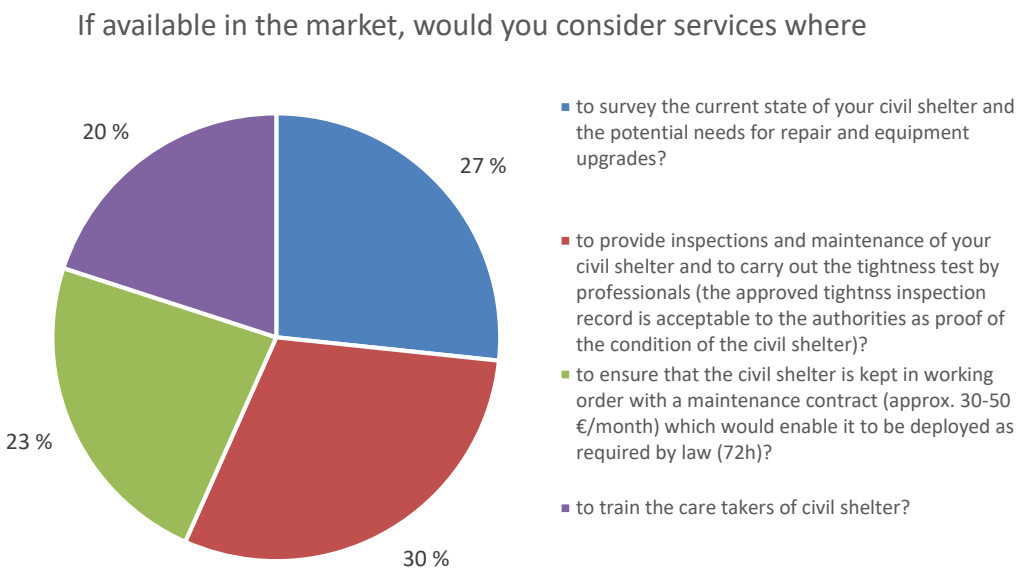

Figure 11. Breakdown of the replies to question three.

The fourth question was “Would you like to participate in the design and development of civil protection maintenance services?”. The answer options were “Yes” and “No” and if answer was “Yes” the respondent was able to leave contact information in the text box if wanted. This question tried to clarify the respondents' interest in civil protection services,

more precisely in the design and development of the services. Based on the answers of the question four, it can be said that over half of respondents are not interested in designing civil defense services, while 35% of respondents would be interested.

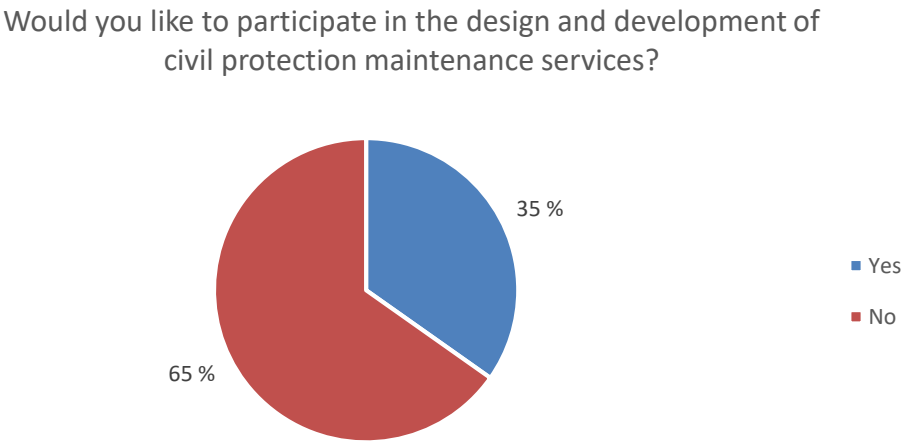

Figure 12. Breakdown of the replies to question four.

The last and fifth question was “Would you like to get information and offers of civil shelter service contracts or other services via email?”. The answer options were “Yes” or “No” and if answer was “Yes”, the respondent was able to leave contact information in the text box if wanted. The purpose of this question was to find out whether the respondents wanted information and offers of the civil shelter maintenance services in the future. Also, idea was to gather contact details of potential future customers to the case company. On the basis of the answers to question five, the respondents did not want information about the services of the civil shelter service by e-mail. This, in turn, shows that the most of respondents are not so interested in civil shelter services.

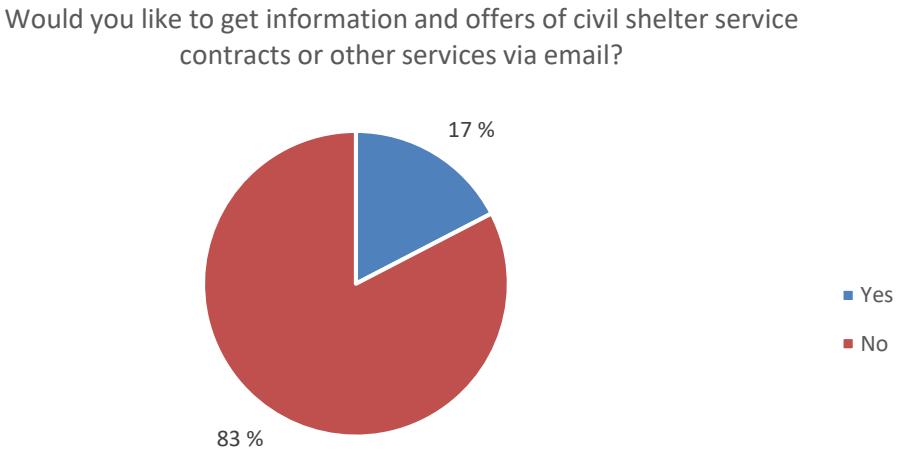

Figure 13. Breakdown of the replies to question five.

7. CONCLUSIONS

In the past decade, increased global price competition has forced manufacturing companies to reconsider the way they are operating. Manufacturing companies realised that they had to begin servitizing by adding services in their offerings that enables to compete with value rather than cost in the market. However, the service business has proven to be a difficult business opportunity for industrial manufacturing companies if the company has no tradition to provide services to its customers, for example alongside the new equipment business. Before, many industrial manufacturing companies considered the service business as unprofitable necessity which had to handle along the new equipment deliveries. In this thesis, the servitization process is considered as a strategic change inside the organisation that involves various internal processes and challenges to overcome in order to achieve its successful implementation.

This research was conducted as an assignment for a civil shelter protection industry operating case company which aims to expand its business from a component manufacturer to a service provider. The aim of the research was to provide useful information of the servitization process by answering the following two research questions;

1. What has to be changed inside the case company (e.g. processes, staff etc.) so that maintenance services can be provided to the customer?
2. How to make the customers interested to purchase maintenance services from the case company?

The literature review material consists of different academic field articles, books and researches which was conducted to answer the research questions focusing on transitions phases of servitization process as well as on its main challenges and benefits. In the empirical part the first research question was studied through literature review of existing theories and theme interviews with experts from three Finnish industrial companies which have successfully expanded to service business. The second research question was approached by surveys, which were sent to potential customers. With the theory review and

the empirical part of this research, the best practices were identified to ease the case company's transition to a service provider.

7.1. Theoretical contribution

During the past 20 years, servitization has been increasingly examined. Many researches, books and final theses from the different industries have applied practices of servitization. The topic has clearly been important for many companies, especially in industries where the pressure on price competition in the market is high. In theory of servitization success stories and reasons for failure are widely presented, but general framework or phases towards a successful service business have not yet been identified. Also, the benefits of the service business such as financial or strategic ones have not been generalised with practical examples.

In this study, the servitization phases from a component manufacturer to a service provider were examined focusing on organisational factors. As concluded in the theory review, the servitization process include many different internal challenges that need to be clarified before providing services to customers and delivering service pledges. A general framework or phases to proceed from a component manufacturer to a service provider have not been identified in the literature. Most common servitization phases are presented in Oliva and Kallenberg (2003) research, which was later proved to be a fairly common way to proceed in the service business. Their four phases (see Figure 7) were found to be the most suitable for the case company when taking into consideration its current position in the service business.

The challenges of the servitization were also examined in the literature review. Kinnunen and Turunen (2012) identified in their research the main challenges of the service business, especially in the servitization process. These challenges were identifiable in the four different phases of servitization presented by Oliva and Kallenberg (2003). As a conclusion, Figure 14 was provided to illustrate the transition phases including the major challenges in each phase. In the first phase, product-based services should be established as

part of the service strategy and the service business should be separated as its own business area in the organisational structure. In the second phase, the focus is on entering the installed base service market and overcoming challenges of creating a service culture and optimising the service offering. In the third phase, the service offering is expanded from transaction-based to relationship-based services and from product-oriented to end-user's process-oriented services that emphasize the expansion of the service business infrastructure, human resource, knowledge and communication management. The final step is to provide larger entities to the customers for example together with a business partner. As a conclusion of the theoretical part, it can be confirmed that the following Figure 14 phases and solving the challenges of each phase provide a good basis for the case company to proceed towards the role of the service provider.

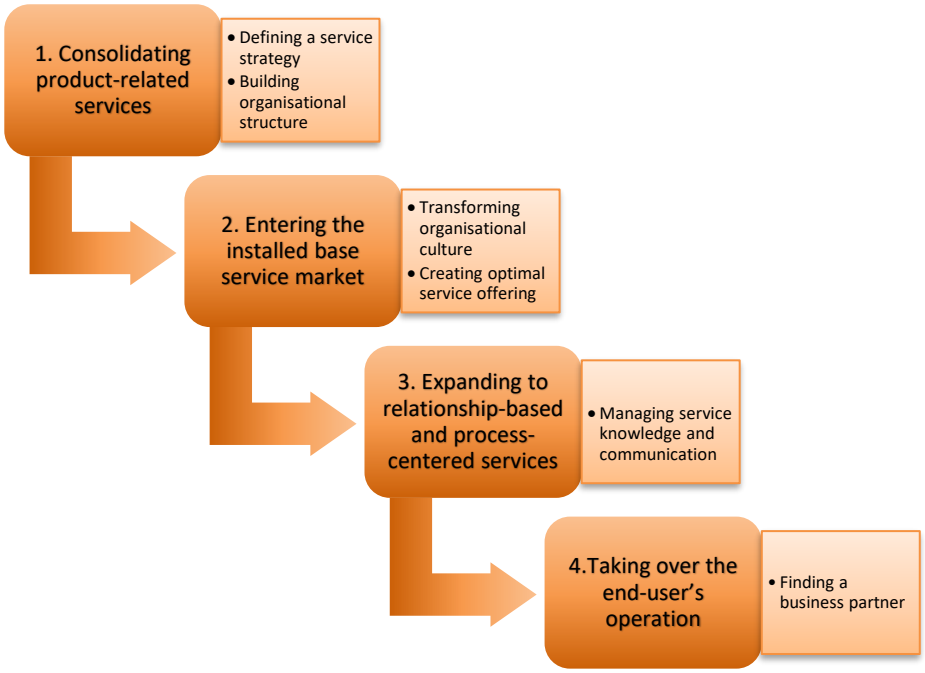

Figure 14. Transition phases and main challenges based on theory review.

7.2. Main findings

This chapter summarises the main findings of this study. The findings include suggested solutions for the research based on the results of the theoretical and empirical part of this

study. The findings of the study are summarised and divided into seven sub-sections below. These points should be taken into close consideration when setting up a case company's service business.

1) Defining a service strategy

In general, service business starts in the organisations with the decision of the top management. In other words, the case company's top management should provide concession and information about possible budget to set up a service business. In turn, the top management needs all available information about the company's business opportunity in the service business. Building a service strategy begins if a business opportunity exists and the top management decides to get involved in service business. For example, the case company can start selling services with maintenance contracts along new equipment sale relying on equipment warranty or statutory matters. Today, the importance of service strategy is increasingly emphasized due to the fast-developing technology. The top management also has the main responsibility in the change management inside the company by defining service business' goals and how to achieve them. When having a successful service business, the top management's work becomes easier since they no longer necessarily need to make adjustment measures in a cyclical way – counterbalance to the cyclical fluctuations is highlighted as an advantage of the service business. In any case, it can be stated that the management of the company plays a key role in starting the service business.

The role of service business in the case company should be determined as central and strategic by the decision of the company's top management. The ultimate goal of the case company should be the role of 'value partner' in their service business. The way of reaching the value partner role is always company-specific, but for example measuring benefits with performance-based digital tools and transforming these benefits to quantified information to the customers might help the case company to reach their goals.

According to the empirical part of this thesis, in the future more and more real-time data will be collected with different sensors as well as analytical analysis conducted from the

obtained data. For example, the case company could improve its maintenance field functions through digitalisation in case of malfunction situations by developing remote services. Of course, this is only possible if the case company's devices are equipped with required sensors. As a conclusion, the future direction of the case-company could be 'Network as a service' way of thinking, where they focus on selling performance in addition with devices. Also, in the future the case company should focus on customisation of customer communication and its channels as it was considered as the next milestone in 2020s by one of the interviewed companies.

2) Building organisational structure

In the empirical part of this thesis, the companies agreed that the decision to go into the service business and set up its own separate business unit with its own management and dedicated service staff immediately after the company was established has been the key step in the success of service business. They stressed that it is especially important to set up a separate service business unit from new equipment when building organisational structure. Separate service business unit forces production, marketing, sale of services and determines service business metrics, human incentives, managerial focus and employee engagement from the service perspective with the different 'clock speed' of equipment and maintenance sales. The key factors in the service business are long-term customer relationships, long-term perseverance and understanding of customer needs, which should be maintained with various activities.

The case company should avoid 'free' services by all means for cost reasons in the service business. The business structure of the case company should be built so that it guides the services related to the delivery of the device, e.g. installation and maintenance services apart by means of the equipment sales business division. In other words, new equipment business salesmen and service salesmen should be different individuals from different departments. Free services should also be avoided, because afterwards it is more difficult to get money from them, even though the service includes added value to the customers and the customers would otherwise likely be willing to pay for it.

Based on the results of the empirical part, the importance of measuring efficiency and profitability inside the organisations will increase in the future. The case company should develop several KPIs to measure the service business' overall sales, profitability (e.g. cross margin), staff turnover, utilisation rate and response rate. It should also have real-time reporting tools for tracking operational and internal accounting. Data from the digital meters should be continuously available to monitor performance and profitability on a monthly or weekly basis. Nowadays, the problem seems to be that there are too many meters in the companies. Therefore, the case company should determine exactly what information it needs.

3) Transforming organisational culture

Transforming organisational culture into a more service-oriented culture, as well as its implementation, is one of the biggest challenges the companies are facing in the servitization process. So far, an unambiguous solution has not been identified. The case company should put efforts on changing the way people think and behave, for example salesmen need to understand that they are selling value and benefits to their customers instead of devices. According to interviewees, it is essential that the company's culture is as service-oriented as possible in order to proceed in the desired direction of service business. The challenge is that the top management is not able to control all activities which have been created to support the transformation in large companies and for this case company should consider developing digital solutions for surveillance.

4) Creating optimal service offering

Case company should always focus on what the customers really want when creating a service offering by doing segmentation based on customer behavior rather than applying 'one size fits all' way of thinking. With todays' digital tools, it is possible to get customer behavior profiles that can be used to tailor services more customer-oriented. Based on the interviews, it can be stated that all the companies consider the service customisation as an essential factor which needs to be developed continuously with different actions. One

recommendation for case company is for example identifying customer needs in the customer interface where salesmen play an important role by collecting tacit information that can be further processed to develop a service offering.

All services provided by the case company must be productised, documented and designed to the market taking into consideration market and technology factors as well as the case company's own competence factors. Also, each service should have a product description, a product card and an exact content definition. When creating service offering it is important to consider carefully the content and delimitation of the services, monitoring, reporting and sale configuration tools that can be used to assemble different service packages.

The case company's service package and so-called optimised service offering should always be tailored according to customer needs by forming 'pieces of the puzzle'. There should also be a discussion with customers about whether they have something special that should be considered and included in the service package. It is very common that some kind of customisation need always exists when a service package is provided for the customers, because a company's service portfolio is never complete. Technology, legislation, or competitive situations can also bring new opportunities and for these reasons case company should always be ready to further develop their service offering. Challenges in customising services can be manifested if the services have been designed too technically, e.g. from the point of view of the service technician, with the compatibility of SAP, or 'inside-out' way of thinking.

5) Managing service knowledge and communication

Management of the case company plays very important factor in successful service business. Therefore, the case company should focus on internal training programs which aim to develop skills of all managers and employees. The aim of the training programs is to continuously improve the service business management and employees' know-how.

Communication inside the organisation might become another major future challenge for the case company that should be addressed and solved with e.g. digital solutions. In global maintenance organisations, the communication challenges are mostly linguistic challenges and due to the mobility of service technicians, which has complicated simultaneous communication. Based on the results of the interviews, internal communication is an essential factor, especially in any change management project.

Service business consists of different internal and external service business processes that should be continuously under development. For example, the case company should be continuously developing the following internal processes: sales development by creating own sales resources for the maintenance business, availability of delivery times, back office functions, description and documentation of all maintenance processes, and internal collaboration between salesmen, installation workers and service managers. In addition, it is proposed that digital tools should be developed to support the above-mentioned processes to enhance the service business. In interviews mentioned external processes that case company should consider and develop in the service business are real-time reporting of work performed to the customers, collaboration with property managers or other partners, and customer communication and partnership.

6) Pursued benefits and possible success factors

In the theory review, the main benefits and challenges of the service business were generally discussed. In the interviews, the company representatives added the following practical benefits of service business; economic significance, equalising cyclical fluctuations, strengthening customer relationships on a long-term basis through customer contacts and with service technicians' help the company is able to detect new business opportunities at the early stage e.g. information about customers' future plans, the global service network brings competitive advantages in the new equipment market, comprehensive knowledge of different manufacturers' devices and understanding of life cycle way of thinking.

In the interviews, the companies were asked about their key success factors in the service business. The answers showed that success factors of the companies did not differ significantly. Most of companies raised the following factors: long history in service business, separate business unit, digitalisation, identifying customer needs and so on. Below Table 10 lists most important factors that have contributed to the success of the interviewed companies' service business to this day which the case company should consider as possible guidelines when setting up a service business.

The key success factors in service business:
• Utilising the experience of service business
• Separating service business to its own business unit
• Quality of the products
• Reliability
• Global service network
• Ability to act quickly
• Using digitalisation
• Customising the service offering to meet customer needs
• Decision of spare parts as part of the service business
• Productisation and documentation of services
• Segmenting customer needs based on customer behavior
• Customer-centric way of thinking
• Measuring efficiency and profitability with different KPIs
• Continuous improvement

Table 10. The key success factors in service business.

7) Surveys

Based on the results of the survey one, it is possible to identify the different issues from potential customers that a case company should take into consideration when creating service offering. First of all, the case company should be aware that there is a clear potential in the civil shelter service business where the competition is low at the moment. The main issue here is that a potential new customer must be made aware of its own need

of civil shelter maintenance services. This means that it is advisable for the case company to begin marketing their service offering with a quick schedule before the situation changes in the market.

When the decision to start the service business has been made, the service offering of civil shelter maintenance should be carefully considered. On the basis of the answers to question three, it can be stated that customers would be relatively evenly interested in all the proposed civil protection maintenance services. In other words, the case company should think about services that include 1) inspection of the current state of civil shelter, 2) individual inspections and repairs, 3) leak testing and maintenance activities, and 4) maintenance contracts and training.

On the basis of the answers of the question four, it can be stated that more than one third of respondents would like to participate in designing and developing civil shelter maintenance services, which shows respondents' interest in them and the lack of the suitable services in the market. Even though the answers of the question four indicate also, that more than half of respondents are not interested in designing the services of civil shelters, it is still worth taking into consideration the needs and opinions of potential customers when building a civil shelter maintenance service offering, e.g. with a separate interview or survey.

Lastly, based on the answers of the question five, it was found that the respondents did not want offers of civil shelter services to their email which should be noted when selling and marketing service to the customers. The case company should consider various options for selling maintenance services, such as face-to-face type of sale, with different business partners or as a part of a larger service packages.

7.3. Limitations

This research was carried out with a theory review and empirical theme interviews and surveys aimed to find the best practices for setting up a service business for the case

company. There are also limitations in this research and the most important ones are related to the empirical part. The limited number of interviewed companies in theme interview and the narrowness of the interview is the biggest limitation when taking into consideration the extent of the topic. Therefore, the interviews can be considered as 'scratches' from different sections of the service business. Also, each interviewed company is individual which makes it difficult to form concrete instructions based on the theory and interviews, especially for the case company whose industry is small and very specific.

The second limitation is the amount of received replies from the three different surveys. Despite the extensive dissemination of the surveys only 27 replies in total were received. The results and analysis of survey 1 were only presented due to the low amount of responses of surveys 2 and 3.

The theoretical part of this study focuses on the first phases of the servitization process as well as its main challenges and solutions. Scholars have also used different terminology in researches that have provided difficulties to collect the information for this study. The phases and challenges of the servitization process presented in this study may differ from those in practice. In addition, research has focused more on the internal challenges of servitization, but the case company may also face different external challenges e.g. legislation competition that are not taken into consideration in this study. As stated before, it is important to build a service business based on customer needs.

The limitations of the research method are related to the number of interviews and survey responses that could have been more. Another limitation of the research method is linguistic since the interview were conducted in Finnish and later translated into English. Likewise, interviews could have been carried out with companies in different fields and with people in different positions.

7.4. Implications for further research

Servitization is continuously examined and several articles are published every year. Thus, there is certainly information in the literature that has not been taken into consideration in this study e.g. issues related to the service process, internal changes and its challenges. Data collection from the literature was challenging due to the previously mentioned variability of the used terms by researchers.

The number and scope of the interviews could be wider in the empirical part. The companies had clearly more information to share in interviews, but due to the time limit, some topics were discussed only briefly. In other words, it would be useful to broaden and diversify the range of interviewed companies in order to find general and best practices of servitization. Thus, it can be stated that the future research interviews would certainly provide a lot of useful information.

Since the surveys for the customers were one limitation of this research due to low rate of responses, further research would bring added value if the potential customer perspective as more intensely taken into consideration, for example with customer interviews to improve knowledge of their businesses, network and contacts. This would increase the data and know-how related to servitization from customer point of view. In theory review, it was found that the customer challenges are related to the challenges of servitization inside the organisation.

This study suggests how the case company could set up a service business, but it does not examine the proposed theory in practice. Thus, for a further research it is proposed to test the theory in practice in the case company and to measure its success with different indicators. Only when the proposed theory steps of servitization have been tested in practice and possibly found useful, then the theory could be tested in other companies. Similarly, the challenges and their solutions in different stages would be important to identify and add to future research.

The goal of this research was to provide general information and best practices for the first steps of the service business for a case company so that it can ease strategic decisions. The challenge now is to utilise this information in practice.

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APPENDIX 1. Theme interview questions.

Teemahaastattelu kysymykset:

1. Tausta (tarvittaessa anonyymi)

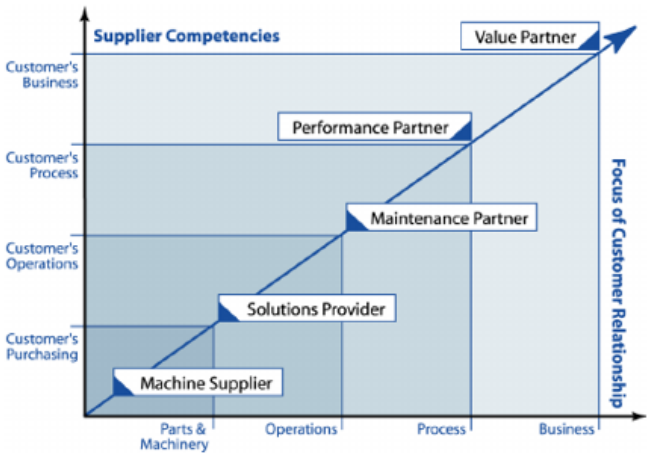
   - Haastateltavan tiedot: nimi, titteli, koulutus ja työhistoria yrityksessä

2. Nykyiset palvelut yrityksessä

   - Millaisia palveluja yritys tarjoaa tällä hetkellä?
   - Mitkä niistä ovat "palvelutuotteita"? (Mitkä palveluistanne ovat tuotteistettu?)
   - Onko teillä palveluja, jotka on räätälöity asiakkaan erityistarpeisiin?
   - Onko teillä "ilmaisia" palveluja? (Ilmaisia palveluja voivat olla esim. tekninen tuki, käyttöönottotarkastus tai joku muu palvelu, jonka myyjä on myynyt "ilmaiseksi" kaupan varmistamiseksi)
   - Onko teillä palveluliiketoiminnalle oma liiketoimintayksikkö vai onko se osa muuta yksikköä?
   - Miten seuraatte palveluliiketoimintanne tehokkuutta ja kannattavuutta?
   - Millaisia palveluja yritys tarjoaa tulevaisuudessa? (Esim. verrattuna kilpailijoihin tai teknologian kehittyessä)

3. Palveluliiketoiminnan rooli yrityksessä

   - Mikä on teollisten kunnossapitopalveluiden rooli yrityksen nykyisessä liiketoiminnassa?
   - Näetkö yrityksen mahdollisesti laitetoimittajana, ratkaisun toimittajana, ylläpitopartnerina, suorituskykypartnerina vai arvopartnerina? Miksi? (Alla oleva kuva esittää muutosprosessin vaiheita laitetoimittajasta arvopartneriksi (Kalliokoski et al. 2003:20)).



   - Millaisilla muutoksilla yritys saavuttaisi ratkaisun toimittajan tai ylemmän roolin palveluliiketoiminnassa?

- Näetkö palveluliiketoiminnan olevan keskeinen osa yrityksen strategiaa tulevaisuudessa?

4. Muutosprosessi laitevalmistajasta palveluntarjoajaksi

- Mitkä ovat olleet tärkeimmät askeleet yrityksen palveluliiketoiminnan kehityksessä tähän päivään mennessä?
- Mistä ja miten olette lähteneet liikkeelle?
- Miten olette lähteneet markkinoille?
- Miten olette kehittäneet huoltopalveluliiketoiminnan prosesseja sisäisesti yrityksessä ja ulkoisesti asiakkaan kanssa?
- Mikä on yrityksenne markkinaosuus palveluliiketoiminnassa, jossa operoitte?
- Mitkä ovat mielestänne palveluliiketoiminnan hyödyt?

5. Muutosprosessin haasteet

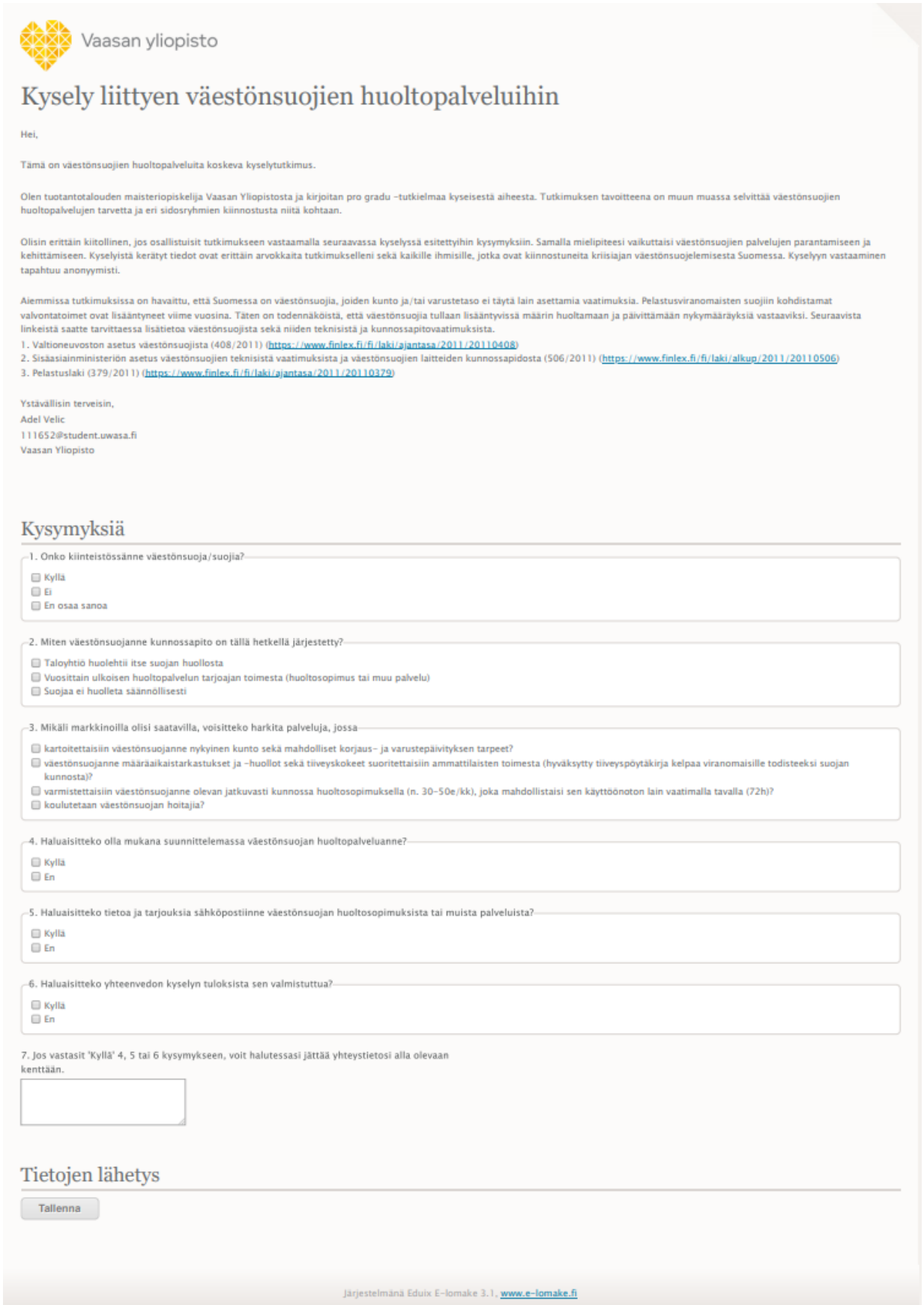
- Mitä haasteita yritys on kohdannut siirryttäessä laitevalmistajasta palveluntarjoajaksi? Mitkä tekijät (ns. menestystekijät) ovat vaikuttaneet yrityksen palveluliiketoiminnan menestykseen eniten?

Alla tarkentavia kysymyksiä:

- Oletteko määrittäneet palvelustrategian? Miten?
- Oletteko rakentaneet organisaatiorakenteen palveluliiketoiminnan ympärille? Miten?
- Miten olette suunnitelleet palvelut markkinoille sopiviksi?
- Miten olette kehittäneet ”optimoidun” palvelutarjonnan?
- Miten olette muuttaneet yrityskulttuurin palveluhenkiseksi?
- Miten johdatte (erikois)osaamista ja kommunikointia?
- Mitkä ovat olleet menestystekijät muutoksessa palvelutarjoajaksi?

6. Kommentteja ja/tai kysymyksiä, jotka haluat jakaa?

APPENDIX 2. Survey 1.



Vaasan yliopisto

Kysely liittyen väestönsuojien huoltopalveluihin

Hei,

Tämä on väestönsuojien huoltopalveluita koskeva kyselytutkimus.

Olen tuotantotalouden maisteriopiskelija Vaasan Yliopistosta ja kirjoitan pro gradu -tutkielmaa kyseisestä aiheesta. Tutkimuksen tavoitteena on muun muassa selvittää väestönsuojien huoltopalvelujen tarvetta ja eri sidosryhmien kiinnostusta niitä kohtaan.

Olisin erittäin kiitollinen, jos osallistuisit tutkimukseen vastaamalla seuraavassa kyselyssä esitettyihin kysymyksiin. Samalla mielipiteesi vaikuttaisi väestönsuojien palvelujen parantamiseen ja kehittämiseen. Kyselyistä kerätyt tiedot ovat erittäin arvokkaita tutkimukselleni sekä kaikille ihmisille, jotka ovat kiinnostuneita kriisiajan väestönsuojelemisesta Suomessa. Kyselyyn vastaaminen tapahtuu anonyymisti.

Aiemmissa tutkimuksissa on havaittu, että Suomessa on väestönsuojia, joiden kunto ja/tai varustetaso ei täytä lain asettamia vaatimuksia. Pelastusviranomaisten suojiin kohdistamat valvontatoimet ovat lisääntyneet viime vuosina. Täten on todennäköistä, että väestönsuojia tullaan lisääntyvissä määrin huoltamaan ja päivittämään nykymääräyksiä vastaaviksi. Seuraavista linkeistä saatte tarvittaessa lisätietoa väestönsuojista sekä niiden teknisistä ja kunnossapitovaatimuksista.

1. Valtioneuvoston asetus väestönsuojista (408/2011) (https://www.finlex.fi/fi/laki/ajantasa/2011/20110408)
2. Sisäasiainministeriön asetus väestönsuojien teknisistä vaatimuksista ja väestönsuojien laitteiden kunnossapidosta (506/2011) (https://www.finlex.fi/fi/laki/alkup/2011/20110506)
3. Pelastuslaki (379/2011) (https://www.finlex.fi/fi/laki/ajantasa/2011/20110379)

Ystävällisin terveisin,
Adel Velic
111652@student.uwasa.fi
Vaasan Yliopisto

Kysymyksiä

1. Onko kiinteistössänne väestönsuoja/suojia?
   - ☐ Kyllä
   - ☐ Ei
   - ☐ En osaa sanoa

2. Miten väestönsuojanne kunnossapito on tällä hetkellä järjestetty?
   - ☐ Taloyhtiö huolehtii itse suojan huollosta
   - ☐ Vuosittain ulkoisen huoltopalvelun tarjoajan toimesta (huoltosopimus tai muu palvelu)
   - ☐ Suojaa ei huolleta säännöllisesti

3. Mikäli markkinoilla olisi saatavilla, voisitteko harkita palveluja, jossa
   - ☐ kartoitettaisiin väestönsuojanne nykyinen kunto sekä mahdolliset korjaus- ja varustepäivityksen tarpeet?
   - ☐ väestönsuojanne määräaikaistarkastukset ja -huollot sekä tiiveyskokeet suoritettaisiin ammattilaisten toimesta (hyväksytty tiiveyspöytäkirja kelpaa viranomaisille todisteeksi suojan kunnosta)?
   - ☐ varmistettaisiin väestönsuojanne olevan jatkuvasti kunnossa huoltosopimuksella (n. 30-50e/kk), joka mahdollistaisi sen käyttöönoton lain vaatimalla tavalla (72h)?
   - ☐ koulutetaan väestönsuojan hoitajia?

4. Haluaisitteko olla mukana suunnittelemassa väestönsuojan huoltopalveluanne?
   - ☐ Kyllä
   - ☐ En

5. Haluaisitteko tietoa ja tarjouksia sähköpostiinne väestönsuojan huoltosopimuksista tai muista palveluista?
   - ☐ Kyllä
   - ☐ En

6. Haluaisitteko yhteenvedon kyselyn tuloksista sen valmistuttua?
   - ☐ Kyllä
   - ☐ En

7. Jos vastasit 'Kyllä' 4, 5 tai 6 kysymykseen, voit halutessasi jättää yhteystietosi alla olevaan kenttään.

Tietojen lähetys

Tallenna

Järjestelmänä Eduix E-lomake 3.1. www.e-lomake.fi

APPENDIX 3. Survey 2.

Kysely liittyen väestönsuojien huoltopalveluihin (2)

Hei,

Olen tuotantotalouden maisteriopiskelija Vaasan Yliopistosta. Kirjoitan pro gradu -tutkielmaa erilaisten väestönsuojien huoltopalveluista toimeksiantona Väistö Groupille (Temet Oy / Suoja-Expert). Tutkielman tavoitteena on muun muassa selvittää väestönsuojien huoltopalvelujen tarvetta ja eri sidosryhmien kiinnostusta niitä kohtaan sekä määrittää optimaalinen väestönsuojan huoltopalvelu.

Tutkimuksissa on havaittu, että ympäri Suomea on väestönsuojia, joiden kunto ja/tai varustetaso ei täytä lain asettamia vaatimuksia. Pelastusviranomaisten suojiin kohdistamat valvontatoimet ovat lisääntyneet viime vuosina. Täten on todennäköistä, että väestönsuojia tullaan lisääntyvissä määrin huoltamaan ja päivittämään nykymääräyksiä vastaaviksi. Seuraavista linkeistä saatte tarvittaessa lisätietoa väestönsuojista sekä niiden teknisistä ja kunnossapitovaatimuksista.

1. Valtioneuvoston asetus väestönsuojista (408/2011) (https://www.finlex.fi/fi/laki/ajantasa/2011/20110408)
2. Sisäasiainministeriön asetus väestönsuojien teknisistä vaatimuksista ja väestönsuojien laitteiden kunnossapidosta (506/2011) (https://www.finlex.fi/fi/laki/alkup/2011/20110506)
3. Pelastuslaki (379/2011) (https://www.finlex.fi/fi/laki/ajantasa/2011/20110379)

Olisin erittäin kiitollinen, jos osallistuisit tutkimukseen vastaamalla kyselyssä esitettyihin kysymyksiin. Samalla mielipiteesi vaikuttaisi väestönsuojien palvelujen parantamiseen ja kehittämiseen Väistö Groupissa. Kyselyistä kerätyt tiedot ovat erittäin arvokkaita tutkimukselleni sekä kaikille ihmisille, jotka ovat kiinnostuneita kriisiajan väestönsuojelemisesta Suomessa. Kaikki vastaukset käsitellään anonyymina.

Ystävällisin terveisin,
Adel Velic
Vaasan Yliopisto

1. Miten väestönsuojanne kunnossapito on tällä hetkellä järjestetty? *

- ○ Taloyhtiö/KOy huolehtii itse suojan huollosta
- ○ Vuosittain ulkoisen huoltopalvelun tarjoajan toimesta (huoltosopimus tai muu palvelu)
- ○ Suojaa ei huolleta säännöllisesti

2. Mikäli markkinoilla olisi saatavilla, voisitteko harkita palveluja, jolla *

- [ ] kartoitettaisiin väestönsuojanne nykyinen kunto sekä mahdolliset korjaus- ja varustepäivityksen tarpeet?
- [ ] väestönsuojanne määräaikaistarkastukset ja -huollot sekä tiiveyskokeet suoritettaisiin ammattilaisten toimesta (hyväksytty tiiveyspöytäkirja kelpaa viranomaisille todisteeksi suojan kunnosta)?
- [ ] varmistettaisiin väestönsuojanne olevan jatkuvasti kunnossa huoltosopimuksella, joka mahdollistaisi sen käyttöönoton lain vaatimalla tavalla (72h)?

3. Haluaisitteko olla mukana suunnittelemassa väestönsuojan huoltopalveluanne Väistö Groupin kanssa? *

- ( ) Kyllä
- ( ) En

4. Jos vastasit 'Kyllä' edelliseen kysymykseen, voit halutessasi jättää yhteystietosi alla olevaan kenttään.

Kirjoita vastaus

5. Haluaisitteko tietoa ja tarjouksia sähköpostiinne Väistö Groupilta väestönsuojan huoltosopimuksista tai muista palveluista? *

- ( ) Kyllä
- ( ) En

6. Jos vastasit 'Kyllä' edelliseen kysymykseen, voit halutessasi jättää yhteystietosi alla olevaan kenttään. *

Kirjoita vastaus

7. Haluatteko yhteenvedon kyselyn tuloksista sen valmistuttua? *

- ( ) Kyllä
- ( ) En

8. Jos vastasit 'Kyllä' edelliseen kysymykseen, voit halutessasi jättää yhteystietosi alla olevaan kenttään. *

Kirjoita vastaus

+ Lisää uusi

APPENDIX 4. Survey 3.

Kysely liittyen väestönsuojien huoltopalveluihin (3)

Hei,

Olen tuotantotalouden maisteriopiskelija Vaasan Yliopistosta. Kirjoitan pro gradu -tutkielmaa erilaisten väestönsuojien huoltopalveluista toimeksiantona Väistö Groupille (Temet Oy / Suoja-Expert). Tutkielman tavoitteena on muun muassa selvittää väestönsuojien huoltopalvelujen tarvetta ja eri sidosryhmien kiinnostusta niitä kohtaan sekä määrittää optimaalinen väestönsuojan huoltopalvelu.

Tutkimuksissa on havaittu, että ympäri Suomea on väestönsuojia, joiden kunto ja/tai varustetaso ei täytä lain asettamia vaatimuksia. Pelastusviranomaisten suojiin kohdistamat valvontatoimet ovat lisääntyneet viime vuosina. Täten on todennäköistä, että väestönsuojia tullaan lisääntyvissä määrin huoltamaan ja päivittämään nykymääräyksiä vastaaviksi. Seuraavista linkeistä saatte tarvittaessa lisätietoa väestönsuojista sekä niiden teknisistä ja kunnossapitovaatimuksista.

1. Valtioneuvoston asetus väestönsuojista (408/2011) (https://www.finlex.fi/fi/laki/ajantasa/2011/20110408)
2. Sisäasiainministeriön asetus väestönsuojien teknisistä vaatimuksista ja väestönsuojien laitteiden kunnossapidosta (506/2011) (https://www.finlex.fi/fi/laki/alkup/2011/20110506)
3. Pelastuslaki (379/2011) (https://www.finlex.fi/fi/laki/ajantasa/2011/20110379)

Olisin erittäin kiitollinen, jos osallistuisit tutkimukseen vastaamalla kyselyssä esitettyihin kysymyksiin. Samalla mielipiteesi vaikuttaisi väestönsuojien palvelujen parantamiseen ja kehittämiseen Väistö Groupissa. Kyselyistä kerätyt tiedot ovat erittäin arvokkaita tutkimukselleni sekä kaikille ihmisille, jotka ovat kiinnostuneita kriisiajan väestönsuojelemisesta Suomessa. Kaikki vastaukset käsitellään anonyymina.

Ystävällisin terveisin,
Adel Velic
Vaasan Yliopisto

1. Ovatko Väistö Groupin palvelut vastanneet odotuksianne? *

- ○ Kyllä
- ○ Ei

2. Jos vastasit edelliseen kysymykseen 'Ei', niin miksi?

Kirjoita vastaus

3. Pitäisikö Väistö Groupin palveluvalikoimaa/palveluita kehittää? *

- Kyllä
- Ei

4. Jos vastasit edelliseen kysymykseen 'Kyllä', niin miten?

Kirjoita vastaus

5. Haluaisitteko olla mukana suunnittelemassa väestönsuojan huoltopalveluanne Väistö Groupin kanssa? *

- Kyllä
- En

6. Jos vastasit 'Kyllä' edelliseen kysymykseen, voit halutessasi jättää yhteystietosi alla olevaan kenttään.

Kirjoita vastaus

7. Olisitteko mahdollisesti kiinnostuneita pidemmän aikaisesta huoltosopimusta (esim. 5-10v)? Pidemmän ajan huoltosopimus varmistaa väestönsuojanne jatkuvan lakisääteisen kunnon, määräaikaistarkastukset ja -huollot sekä tiiveyskokeet vaivattomasti ja edullisemmin. *

- Kyllä
- En

8. Olisitteko mahdollisesti kiinnostuneita väestönsuojan hoitajan koulutuspalvelusta? *

- Kyllä
- En

9. Haluaisitteko tietoa ja tarjouksia sähköpostiinne Väistö Groupilta väestönsuojan huoltosopimuksista tai muista palveluista? *

- ○ Kyllä
- ○ En

10. Jos vastasit edelliseen kysymykseen 'Kyllä', voit jättää yhteystietosi alla olevan kenttään.

Kirjoita vastaus

11. Kuulisimme mielellämme mielipiteenne palveluistamme (esim. liittyen laatuun, asemaan kilpailijoihin nähden), jotta voisimme kehittää niitä tulevaisuudessa.

Kirjoita vastaus

+ Lisää uusi