MASTER'S THESIS

THE USE OF FORMAL SERVICE DESIGN PROCESSES IN SERVICE INNOVATION

Interactions and perceptions of methods, frameworks, or processes for service design, and related challenges

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Service Engineering and Management

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Graz, 17. July 2020 .....

Signature

SWORN DECLARATION

I declare on my word of honor that I have written the present paper independently and without outside help, that I have not used any sources other than those indicated, that I have quoted the sources used verbatim and that I have marked the passages taken from the contents as such.

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Signature

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ABSTRACT

Literature finds that, despite the various benefits cited, formal processes for the design of services are not often used in manufacturing companies. This finding leads to the research question about the interaction of employees with service design processes, and how this relates to the other struggles faced by those employees in service innovation.

A literature review and case study were performed in order to answer the research question. The literature review gave a theoretical background of the topic at hand and provided a basis for the case study analysis. A survey was developed with a mix of single choice, multiple choice, and open questions. Answers from 13 respondents representing nine companies were analyzed.

It was found that the usage of service design methods, frameworks, or processes have benefits and help to solve challenges in service innovation. Respondents in the case study have generally positive views of service design methods, frameworks, or processes, and, although their usage is sporadic, respondents do not see the lack of methods, frameworks, or processes in service design to be a top challenge for accomplishing service innovation.

While this case study has a small sample size and is limited in scope to manufacturing companies with a presence in the Styrian market, it can open the door to future research into the use of methods, frameworks, or processes in service design and their role in solving challenges faced by manufacturing companies transitioning into the service market.

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1 INTRODUCTION

A common theme in the literature involving service design centers on how the use of service development processes and frameworks in manufacturing companies is one of the most important factors to being successful in the service market. However, often the same literature is finding that manufacturing companies are not likely to use formalized methods, frameworks or processes for designing services. Other research shows that even when methods, frameworks, or processes are being used, they are often based on ill-fitting models and therefore actually counterproductive to their goal of improving the design of services.

This disconnect between what the literature says should be happening verses what the literature says is happening led to the interest in taking a closer look into this subject.

1.1 MOTIVATION

When the concept of service blueprinting was introduced in 1984 by G. Lynn Shostack, it helped to kick off a genre of research focused around services and service design. Throughout the past 25 years, two major themes in this research have been present: the challenges and success factors for manufacturing firms transitioning into the service market, and how service design practices impact a firm's ability to provide successful services to its customers. While research shows that using a formalized service design process has benefits for companies in the service market (see Figure 3) and several service design frameworks have been introduced (see Figure 4), studies are also finding that many companies are not using formalized processes but are more likely to design services *ad hoc* (Shulver, 2005). Additionally, there is a lack of literature which questions the reasons why companies are more likely to use *ad hoc* methods of service development even if the use of formalized processes is cited as a major success factor. Since the employees of companies are the users of these methods, frameworks, or processes it seemed fitting to explore their interactions with these topics. This paper will attempt to help fill the gap in current literature around these topics, by starting to explore the use of methods, frameworks, or processes for service design in deeper detail.

1.2 RESEARCH PROBLEM AND QUESTIONS

The goal of this work is to identify how employees involved in the design of services in manufacturing companies interact with and perceive methods, frameworks, or processes for service design, and how this relates to their struggles with service innovation. Research is showing contradictory evidence about the impact of using formalized service design in manufacturing firms, and this work aims to bring some clarity to the topic. The findings of this study could be used as a jumping off point for further research that explores related topics and

can help to expand the conversation about the contradicting information that is found around the use of methods, frameworks, or processes in service design.

A literature review will establish a baseline understanding of this topic and a case study will be used to evaluate this question more in depth.

1.3 SCOPE OF RESEARCH

The scope of this research is service innovation and new service design in manufacturing companies with a presence in the Styrian market who offer both products and services to their customers. More specifically, however, the focus is on how employees involved in service design in these companies are using service design methods, frameworks, or processes, what they think about the use of them, and how this relates to what main topics they struggle with in service innovation. Manufacturing companies are specifically of interest for several reasons. First, “smart” manufacturing companies started moving into the service industry in the last 30 years (Wise & Baumgartner, 1999), and “management literature is almost unanimous in suggesting to product manufactures to integrate services into their core product offerings” (Oliva & Kallenberg, 2003, p. 160). However, being new to the service business means that these companies are entering uncharted territory and have limited experience with these topics. Second, service development processes are complex “and there are a number of unique aspects of service development that need to be taken into account that do not necessarily exist in…new product development” (Kindström & Kowalkowski, 2009, p. 157).

The case study focuses on gathering information from employees whose job responsibilities involve designing services at manufacturing companies with a presence in the Styrian market. The participants will take part in a survey about their experiences and struggles with service innovation and designing new services. The case study will not answer the question of why the use of methods, frameworks or processes for designing services is seen as a major success factor in previous studies despite the fact that they are not being used very often. However, it will help to establish how employees interact with and perceive the use of methods, frameworks or processes for designing services, including how often they use them, how important they think the use of them is, and also the biggest challenges they face in service innovation.

1.4 DEFINITIONS

The design of services is an inter-disciplinary topic of study which is influenced by several academic fields and is therefore defined multiple ways in the literature, each with a slightly unique twist. Common terms are Service Design, Service Engineering, New Service Development (NSD), and Service Innovation.

Service Design is defined as the systematic application of design methodologies and principles to the design of services (Holmlid & Evenson, 2008). According to Bullinger, Fähnrich, and Meiren (2003), NSD is more market-oriented and Service Engineering is a more technical-methodological

approach, but both focus on the development and design of services. Service Innovation is defined as the creation of new or improved service offerings, processes, and business models (Ostrom, et al., 2010). While these are not necessarily interchangeable terms, the terms and definitions are evolving and either often closely related or even overlapping. In this paper, the term “service design” will be used to discuss the creation of new or improved service offerings but will not assume that any particular methods, frameworks, or processes are being followed. This definition is fitting to the *ad hoc* nature of designing services that literature says is standard in manufacturing companies. Service design methods, frameworks or processes will be used to generically describe anything used to help accomplish service design in a formal, systematic way.

In addition, it is important to point out that “smart services” have become an increasingly common topic of research, but even if some companies may use, and some literature may suggest, different methods, frameworks or processes to design various kinds of services (Gebauer, Krempl, & Fleisch, 2008), this paper does not distinguish between different types of services, such as “traditional” services, including maintenance and helpdesk support, or “smart services”, including dashboards and monitoring. Instead, the focus is on any services which are sold to customers.

1.5 Structure of Research

The research is conducted with a literature review and a case study. Section 0 deals with the research methods of both parts. In Section 0, an in-depth literature review is performed to lay out different existing approaches and findings surrounding this topic. Based on this, Section 0 describes the execution and results of the case study. The conclusion and discussion combine the two methods in Section 0. Figure 1, gives an overview of the structure of research.

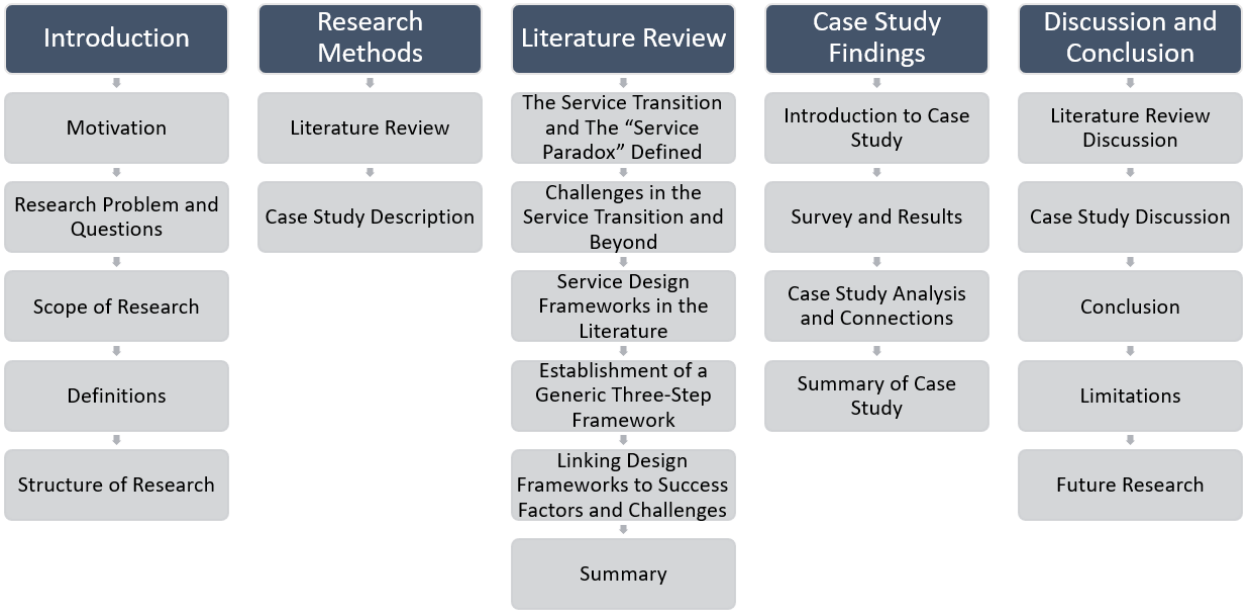


Figure 1. Structure of Research (own presentation)

2 RESEARCH METHODS

The research methods of this paper are a literature review and an empirical case study. These will be explained more in depth below.

2.1 LITERATURE REVIEW

A literature review was conducted using various search engines, including Google Scholar, ResearchGate, Emerald Insight, EBSCO, and others, in order to find appropriate and relevant material for the topic at hand. Search terms focused around “service innovation”, “service design”, “service engineering”, and other key words such as “roadblocks”, “challenges” and “frameworks”. Moreover, terms such as “product-dominant companies” and “manufacturing companies” were used to narrow the search and find applicable results. Citations from found literature were also very helpful to expand the sources and dig deeper into specific ideas and topics of interest. Besides traditional academic research, “how-to” books on service design were used to provide a practical, real world view of service design practices. Even if these resources tended to focus more on services in the service industry and not the manufacturing industry, they provide a solid background especially on the specific tools used in service design. Since the topic of service design is relatively young (Concalves & Saco, 2009) the articles used naturally fall within a limited time range of the 1980’s to present day.

Once a broad literature review was completed and a solid understanding was beginning to form around the topic of success factors and struggles in service innovation in general, a second concentrated review was done specifically around the use of service design methods, frameworks, or processes in manufacturing companies. This also helped in the comparison of literature, as studies focused on manufacturing companies are more likely to be applicable to one another.

The found literature was then analyzed by highlighting and summarizing the most relevant parts of the articles as well as organizing the literature into several different categories. Connections were made between the literature pieces and were compared to each other on different themes, including publication date, core topic, case study description, and author. In addition, literature which proposed a specific service design framework was analyzed in more depth to find further connections.

These analyses led to the discovery of patterns and provided a roadmap to the thesis structure and direction, including inspiration for and development of the case study and survey questions, which allowed for a more concentrated look into these topics.

Altogether, around 150 articles and books were reviewed, with varying degrees of applicability and usefulness to the research topic.

2.2 CASE STUDY DESCRIPTION

In the attempt to get a more clear picture about how employees of manufacturing companies with a presence in the Styrian market are using methods, frameworks, or processes for service design, what they think about the use of them, and the struggles they are facing with service innovation, a survey was developed. The survey includes a mix of single choice, multiple choice, and open questions, which were inspired by the findings of the literature review, in order to explore the research topics in more detail. The aim was not to find out which methods, frameworks, or processes are used by these employees, or about how successful these companies were in introducing services, but instead to generalize the interaction, perception, and use of them broadly in terms of perceived usefulness, frequency of use, etc. Furthermore, the goal was to determine the main challenges employees are facing in their work with service innovation. This information could then be used to make connections to the literature, form conclusions about the research questions, and to suggest a direction for further research.

2.2.1 Material

The survey includes 17 questions in total. Four of the questions are for gathering information about the participant. One is a disqualification question since it asks if the design of new services is a part of the survey respondents job responsibilities. Two are an opportunity for the respondent to expand on any of the previous answers or to add comments about the topic of the survey in general. Therefore, there are 10 main questions in the survey, eight of which are marked as requiring an answer. These core questions are used to establish how the employee interacts with and perceives the use of methods, frameworks, or processes for service design, and additionally what top challenges the participants face in their work with service innovation. Example survey questions include if the company of the employee has documented methods, frameworks, or processes for service design, how important they feel the use of them is for designing services, how often they use them, and selecting statements about their opinion about using them for service design (for example, “they are flexible/inflexible”, “management supports the use of them/does not support the use of them”).

Most of the survey questions were inspired from the findings of the literature review and were chosen in an attempt to make sense of some of the contradictions found. The answers to different questions can be compared to each other in order to confirm, question, or add to the discussion about the findings of the studies in the literature review. The survey was designed so that respondents without training on service design methods, frameworks, or processes would be able to understand and answer the questions, although some familiarity with the topics is assumed as the design of new services must be a part of the job responsibilities of the qualifying respondents.

The online format of the survey is intended to be convenient for the respondents and to increase the likelihood that more respondents will agree to participate. Additionally, the survey was designed to be completed in approximately 10 minutes, also for conveniences purposes. The online format has some downsides, especially since questions and answers cannot be elaborated on or clarified from either side in the same way that is possible in a verbal interview.

Special attention was paid in the survey wording and design so that participants with Business English level language skills would be able to understand and complete the survey without difficulties.

2.2.2 Participants

Survey responses are intended to be gathered from employees whose responsibilities include the design of new services at manufacturing companies who sell both products and services to their customers. There is no distinction made about the types of services that these manufacturing companies provide, for example, “traditional” services such as maintenance and helpdesk support or “digital or smart services” such as dashboards and monitoring, the focus is on any services which are sold to customers. There is also no distinction about where in the “service transition” the companies are, or if the companies are just beginning to add services to their portfolios or if their service business is already well established.

Most of the people who were asked to participate in the case study work at manufacturing companies which are headquartered in Styria, Austria. However, this was not a specific requirement for the respondents, and the survey was also sent to employees of companies who have a presence in the Styrian market but are not necessarily headquartered there. Several of the companies also have an international presence, including having offices which are located outside of Austria.

A majority of the people asked to participate in the case study were students in the Campus 02 “Service Engineering and Management” MBA program. Therefore, it is expected that many of the respondents do have formal training on designing services and work for companies where a baseline knowledge about methods, frameworks, or processes used for service design does exist.

The job descriptions and titles of the participants, while kept anonymous, are varied and range from the C-Level of the organization to Directors, Service Owners, Service Designers, and Project Managers. This represents a mixture of different types of services (traditional and smart) as well as different levels throughout the companies, although most, if not all of the respondents, are in management positions within their companies.

As the survey focuses on employees who work for manufacturing companies which are based in Austria, it can be assumed that a vast majority of the participants speak English as a second language.

3 LITERATURE REVIEW

Although literature around services in general is a much wider topic, the focus of this research is mainly, although not exclusively, around services in manufacturing companies. Manufacturing companies are of special interest because they face unique challenges in providing services as compared to traditional service companies. For example, there is often a long and successful product history embedded in "the mind set" of these companies which bring obstacles to the organization's ability to successfully add services to their portfolio (Nuutinen & Lappalainen, 2012), which does not exist for pure service companies. This literature review establishes a baseline knowledge of services in manufacturing companies and helps in understanding what themes are most important or most common in the study of service innovation. It then takes a closer look at the research topic of the use of methods, frameworks, or processes in service design.

Due to the inter-disciplinary nature of the topic at hand, special attention has to be paid to the content of the articles in order to determine if they are relevant to the search, since, as previously mentioned, Service Design, Service Engineering, NSD, and Service Innovation are often used interchangeably. However, their meaning is different depending on the researcher and therefore not every article referencing these terms is applicable to the research. Additionally, the terms of methods, frameworks, and processes vary across the literature and are often difficult to compare the meanings from author to author. Therefore, the previously mentioned definition of service design methods, frameworks or processes is used to generically describe anything which helps accomplish service design in a formal, systematic way.

A major theme of the found literature centers around the "service transition" of manufacturing firms, who previously relied solely on selling products, beginning to introduce or expand service offerings to their customers. It becomes immediately clear that this transition is not without difficulties. A significant amount of literature acknowledges the "service paradox" that companies face when transitioning, namely, that they expand their service offerings but are unable to meet financial goals (Gebauer, Fleisch, & Friedli, 2005). As this topic of research expands, a common theme is that the actions taken by the company during this transition can predict how successful or unsuccessful companies are at introducing services into their portfolios. One of the most commonly found success-predicting factors is the use of formal service design processes. Interestingly, while the use of a formal service design process is said to be a success factor, several studies found that many companies are not using them. Adding a layer of complexity to the issue, a small number of studies found that the use of formal design processes is not a predictor of success at all.

The following sections will discuss these results in greater detail.

3.1 THE SERVICE TRANSITION AND THE "SERVICE PARADOX" DEFINED

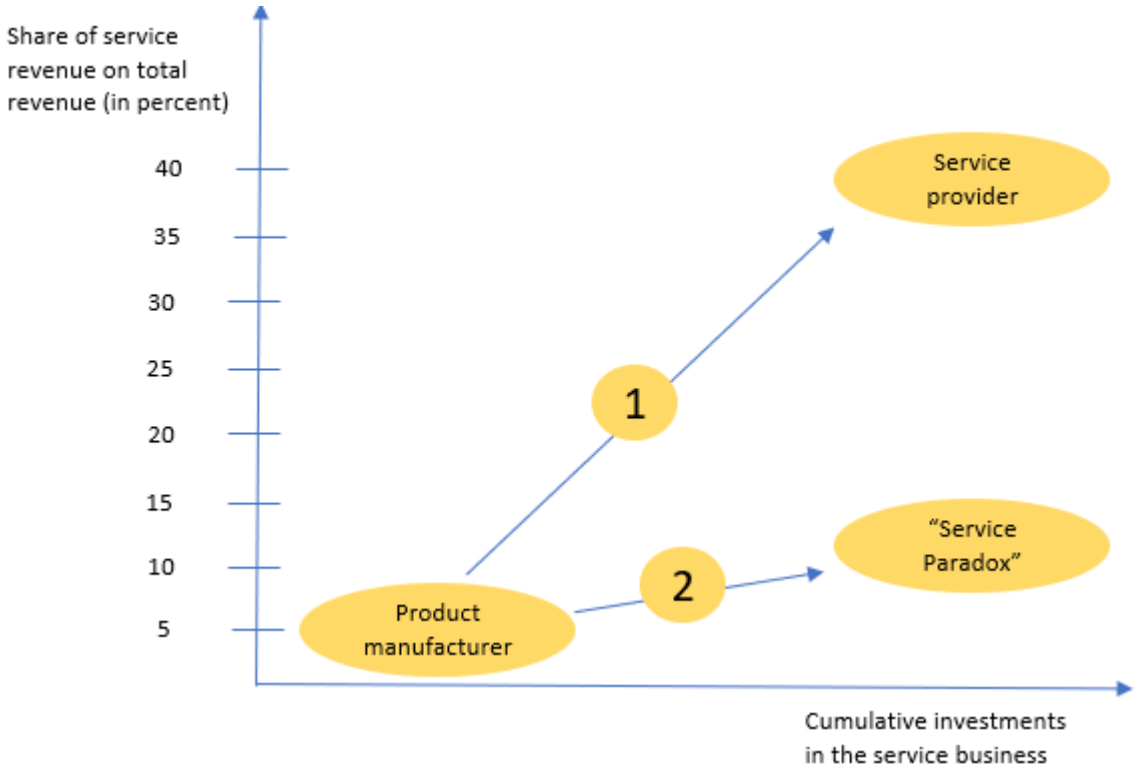
"Moving downstream" and including services into their core offerings was seen as a way for manufacturing companies to be successful in the 1990's era when manufacturing was struggling (Wise & Baumgartner, 1999), but remains relevant also today. Three reasons that manufacturing companies are encouraged to transition into providing services are economic demands to increase revenue, customer demands for services, and the demand to stay competitive in the market (Oliva & Kallenberg, 2003).

However, even if companies want or need to make this transition, a common theme in the literature is the difficulties they are encountering during the transition period. Gebauer and Friedli (2005) for example, say "most companies find it extremely difficult to manage the transition successfully" (p.70).

This change in business model from product manufacturer to service provider is known as the transition line (Gebauer, Fleisch, et al., 2005). Becoming a service provider is the goal of the transition, which means that companies are "moving downstream" and increasing their investment in their service business. This progression from pure product manufacturer to service provider can be called the "service transition" and there is a wealth of literature which touches on this topic.

The "Service Paradox", coined by Gebauer, Fleisch, et al. (2005), is the phenomenon of manufacturing companies investing in service offerings but failing to get financial benefits from their transition into the service market. Although not the first authors to identify struggles in the service transition, they were the first to name it as such.

As seen in Figure 2, their work states that a product manufacturer can take two paths when attempting to make this transition: the successful transition path, which leads the company to become a service provider, and the unsuccessful transition path, characterized by increased service offerings and higher costs but no corresponding increase in returns, which leads the company to the service paradox (Gebauer, Fleisch, et al., 2005). Essentially, the Service Paradox is a mismatch between the financial expectations and the reality of introducing services into manufacturing companies.



1	Manufacturing companies successfully exploit the financial potential of an extended service business
2	Manufacturing companies struggling to exploit the financial potential of an extended service business
Product manufacturer	Services as an add-on to the product, service revenue is quite low, main share of value proposition stems from the product and a few services such as installation, documentation, spare parts,...
Service provider	A major part of total value creation stems from services, a large number of services including product-related services and customer support services such as maintenance contracts, consulting services, financial services...
"Service paradox"	High investment in extending service business leads to increased service offering and higher costs, but does not generate the expected correspondingly higher returns

Figure 2. The Transition Line and Service Paradox (Gebauer, Fleisch, et al., 2005, p. 15)

3.2 Challenges in the Service Transition and Beyond

After providing a baseline understanding and definition of the service transition and service paradox, the struggles companies face during the service transition can be explored more in depth.

First, however, it is important to note that Gebauer, Fleisch, et al. (2005) focus their research around success in the service transition as being an exclusively financial measurement. This

focus, while being the bottom line for companies, may leave out several other important factors that could also be evaluated as a benchmark for success, such as customer satisfaction, customer loyalty, and market share. It can be argued that failing to produce success in any of these other measures could be the underlying reason for failing to be financially successful and should be evaluated along with financial success in order to provide a full picture. However, this is not explored further in this paper but could be an area for further research.

It is also important to point out that the borders of the service transition are unclear, and it is difficult to say at which point a company has completed the transition phase to become a "service provider". Gebauer, Fleisch, et al. (2005) define a service provider as a company where "a major part of total value creation stems from services, [and who offer] a large number of services including product-related services and customer support services such as maintenance contracts, consulting services, [and] financial services" (p.15). This leads to the question of at what point companies are counted as being in the transition phase in contrast to already completing this step, and additionally how the research focusing on the service transition applies to companies who are already beyond the transition period.

The topic of what manufacturing companies should continue to do in order to stay successful in the service business and if that differs from what they already did in order to become successful has not been well studied in the literature and is an opportunity for future research. However, once again, success is loosely defined in this context as financial success, and the meaning of success could vary widely across companies

It is possible that some of the struggles mentioned in the following sections are only valid during the transition phase of becoming a service provider and not necessarily applicable once a company has reached that status. This could pose an issue for the case study, which does not establish at which point along the transition the companies currently are. However, the assumption of this work is that, at a minimum, the topics of service design and the use of methods, frameworks, or processes to design services continues to be relevant for companies beyond the service transition phase.

3.2.1 Structural, Cultural, and Strategic Challenges

The challenges that companies face in the service transition are diverse across the literature. It should be noted that there is more than one way for a company to position itself along the transition line with diverse service strategies (Ebeling, Friedli, Fleisch, & Gebauer, 2014) and these challenges will impact different companies in various frequencies and intensities. Although not every challenge in the literature will be addressed, some of the most common ones will be discussed. These can be broken up into separate, but often overlapping, categories of structural, cultural, and strategic challenges.

3.2.1.1 Structural Challenges

Structure has to do with how the company arranges itself, including how departments are organized, to which degree work processes are standardized, how formally roles and tasks are defined, and how management and decision-making is centralized or dispersed (Jaakkola & Hallin, 2018).

Structural challenges mentioned in the literature include the service organization not being a separate business unit with profit-and-loss responsibility (Oliva & Kallenberg, 2003), and the service development tasks and responsibilities being unclear (Dörner, Gassmann, & Gebauer, 2011).

Since services are often seen as add-ons to products, they are frequently given away as a cost-free bonus when buying a product, however, this devalues services and can lead to lower profits (Oliva & Kallenberg, 2003). For this reason, Oliva and Kallenberg (2003) suggest establishing a separate business unit and sales force specifically for services. Even with a separate business unit however, this bundling of services into the sale of products can lead to service profits being "lost" and included in the profits of products (Gremyr, Löfberg, & Wittel, 2010). This can result in the artificial deflation of the profitability of services, making it look like the service unit is facing more financial struggles than it actually is.

In a later study, it was found that the separation of services into their own business unit, while having positive effects on managerial commitment to the service strategy and financial measures, has negative effects on non-financial measures, such as customer satisfaction (Oliva, Gebauer, & Brann, 2012). This, however, could be linked to the customer perception of the quality expectation of free verses paid services, as well as the dissatisfaction stemming from being charged for a service that was previously provided at no cost. Despite these negative consequences, the authors still recommend that the service business be a separate business unit (Oliva et al., 2012).

In their case study, Neu and Brown (2005) discuss a "'language problem'" (p. 244) that exists between service and product branches of the organization, especially for product-based services. There is a disagreement as to what the service team is responsible for and what the product team is responsible for, which can lead to a situation where the customer tries to get "support" but no one in the company knows who should provide it, which leads to the customer being left unsupported. Dörner et al. (2011) talk about how research and development departments do not see themselves as involved in services but instead only as technical innovators, and because of this, services are left to be developed solely from a marketing point of view. This lack of consideration of technical topics and input from technical experts can lead to services being developed with a lack of perspective and therefore unable to meet the full needs or expectations of the customers. Additionally, if the responsibilities for the development of services is unclear, it is only logical that there will be difficulties in accomplishing service development in a systematic way.

3.2.1.2 Cultural Challenges

Culture can be defined as the social order of an organization that shapes attitudes and behaviors, including what is encouraged, discouraged, accepted or rejected by the company (Groysberg, Lee, Price, & Cheng, 2018).

Cultural challenges mentioned in the literature include a company culture that is not open to service innovation (Bettencourt & Brown, 2013), the company having difficulties handling change (Parris, Bouchet, Peachy, & Arnold, 2016), the lack of intra-firm collaboration (Neu & Brown, 2005), and the insufficient experience to manage services within the company (Uchihira, et al., 2008).

Any transition, including the service transition, involves change, and the service transition can require changes in the organization and culture which can cause challenges for companies. Gebauer, Fleisch, et al. (2005) discuss the “clash” that can occur when a company has to transition from manufacturing values to service values, saying “this potential clash between different norms and values (cultures) can be viewed as a clash between a dominant culture and a counterculture.” (p. 21). They go on to suggest that a balancing has to happen in order to avoid more internal problems, saying “the managerial challenge is to create a service culture, which entails maintaining an uneasy symbiotic relationship.” (p. 21). The topic of balance comes up again when they explain how many manufacturing companies believe that their culture is what has made them successful with their products in the first place, and therefore cultural changes must not be a replacement of the existing culture with a new one, but a balancing of the product and service cultures. Another way to help companies embrace a service culture, and the change that comes with that, is to encourage an internal outlook of selling solutions rather than products and/or services (Parida, Sjödin, Wincent, & Kohtamäki, 2014) and to focus on the value produced by the solution. This can lessen the unhealthy competition between products and services that can occur during this time.

Although separating services into their own business unit is a suggestion for a successful service transition, this can also cause an issue with intra-firm collaboration if the business units do not properly work together. In the three cases of successful B2B service development projects, Neu and Brown (2005) found in their study that “managers [of the successful companies] integrated the responsibilities of multiple value chain activities across multiple business units to provide a complex product” (p. 11). Additionally, they find that collaboration, including the sharing of resources, helps to navigate the complex market of services. Intra-firm collaboration can also help to solve the issue mentioned above about the responsibility of service development being unclear; if the company is working together across multiple departments or in multi-departmental teams, the responsibility is automatically shared across these different branches of the company. Another way to help with intra-firm collaboration, as suggested by Gebauer, Krempl, Fleisch, and Friedli (2008) is frequent job rotation, as “work experience in both areas enhanced the optimization of product and product-related services in terms of proper product functioning” (p. 395).

Additionally, manufacturing companies tend to simply have limited experience with services and encounter difficulties “because their skills, mental models, design processes, and organization

are built up and optimized for product design and not for service design" (Urchihira et al., 2008, pg. 1549). This is a challenge especially in the early transition period when experience with services is limited or non-existent.

3.2.1.3 Strategic Challenges

Strategy is what provides a company with clarify and focus for collective action and decision making in order to meet goals (Groysberg, Lee, Price, & Cheng, 2018).

Strategic challenges discussed in the literature include a lack of strategic alignment throughout the company (McDonough III, Zack, Lin, & Berdrow, 2008), a lack of market knowledge (Ebeling et al., 2014), improper business model adjustment to take into account the service business (Kindström & Kowalkowski, 2014), disagreement in the company about customer needs (Ulwick & Bettencourt, 2008), the failure of the service offering to fit the current business (Martin & Horne, 1993), and the lack of a formal, planned approach to the design and introduction of new service offerings (de Brentani, 1995).

Martinez, Bastl, Kingston, and Evans (2010) discuss in their case study how one of the key issues in the service transition is strategic alignment. A failing strategic alignment can be defined as the "absence of internal cooperation, common language and alignment of mindsets [which] slows down transformation efforts" (p. 462). This, again, is something that is caused by the tension in a manufacturing company that can exist between products and services.

When companies start expanding into services they are entering into a new market, even if they may be offering services to the same customers which they have already established relationships with through their product business. Additionally, services are seen as a complex market, which may require special considerations. Neu and Brown (2008) discuss how in order to serve the needs of a complex market, companies need to pay attention to both individual customers and the customer base as a whole, saying:

> *…performance will be enhanced by adopting both a market and a customer-centered orientation. A market orientation should direct organizational activities at aligning marketing programs to fit the complex needs of individual customers, while a customer-centered orientation should direct activities toward designing programs to accommodate the heterogeneity of needs and wants that exist among customers. (p. 247)*

While designing for customer needs is not new for manufacturing companies, designing for a service market can be, and Neu and Brown are reminding their readers to take both into account. However, this may be easier said than done, as Ulwick and Bettencourt (2008) find that less than 5% of companies in their study said that there was internal agreement as to what a customer need is. Therefore, they instead suggest focusing on the job the customer is trying to get done, as well as the desired outcome statements, in order to find ways to really discover customer needs. Bettencourt, Brown, and Sirianni (2012) agree, saying "in order to truly innovate, firms must expand their focus beyond existing services and service capabilities to address the fundamental needs of their customers, including the jobs and outcomes those customers are trying to achieve" (p. 13). Therefore, the knowledge of the changing market and customer jobs

must be in focus, instead of what has been done in the past in order to meet customer needs. Bettencourt and Brown (2013) also find that a focus on customer jobs is important for cultural and process changes, saying “though such a change is a challenging undertaking, the resultant transformation will enable the company to produce ongoing service innovations that lead to sustainable competitive differentiation” (p. 282).

Kindström & Kowalkowski (2014) start to connect all aspects of the delivery of a service by stressing the strategic benefits of using business models “to visualize how and when changes might occur, which should increase internal transparency, understanding, and awareness of service opportunities and necessary changes” (p. 106). This should help companies focus on the other strategic challenges mentioned.

Lastly, the lack of a formal, planned approach to the design and introduction of new service offerings being seen as a major challenge for manufacturing companies (de Brentani, 1995) is core to this literature review and case study, and will therefore be discussed more in depth in the following sections.

3.2.2 A Deeper Look into the Use of Service Design Processes

In order to get a better view of why it would be seen as a major challenge in the service transition to not be using formal methods, frameworks, or processes in service design, a closer look at the benefits, usage, and history of service design methods, frameworks, or processes is useful.

3.2.2.1 Benefits to the Use of Service Design Processes

As previously mentioned, one of the common challenges that companies face in the service transition is the lack of a formal, planned approach to the design and introduction of new service offerings. According to studies, the use of a formal service design process is a key factor of success in the service transition.

Figure 3 gives and overview of several authors whose studies show specific benefits to the use of service design processes.

Bullinger, H.-J., Fähnrich, K.-P., & Meiren, T. (2003)
Costa, N., Patrício, L., Morelli, N., & Magee, C. (2018)
de Brentani, U. (1991)
de Brentani, U. (1995)
Dörner, N., Gassmann, O., & Gebauer, H. (2011)
Ehrenhöfer, C., & Kreuzer, E. (2013)
Gebauer, H., Fleisch, E., & Friedli, T. (2005)
Gebauer, H., Friedli, T., & Fleisch, E. (2006)
Gebauer, H., Krempl, R., Fleisch, E., & Friedli, T. (2008)
Gremyr, I., Löfberg, N., & Wittel, L. (2010)
Holmlid, S., & Evenson, S. (2008)
Kelly, D., & Storey, C. (2000)
Kim, S. K., Ishii, K., Breiter, K. A., Naoshi, U., & Kyoya, Y. (2010)
Kindström, D., & Kowalkowski, C. (2009)
Kindström, D., & Kowalkowski, C. (2014)
Kreuzer, E., & Aschbacher, H. (2011)
Kreuzer, E., Schäfer, A., & Aschbacher, H. (2011)
Pezzotta, G., Sassanelli, C., Pirola, F., Sala, R., Rossi, M., Fotia, S., . . . Mourtzis, D. (2018)
Shostack, G. L. (1984)
Uchihira, N., Kyoya, Y., Kim, S. K., Maeda, K., Ozawa, M., & Ishii, K. (2008)
Wittel, L., Edvardsson, B., Meiren, T., & Schäfer, A. (2016)

Figure 3. Authors mentioning specific benefits to using service design processes (own presentation)

Formal methods, frameworks, or processes in service design have been shown to help eliminate potential failure points in a service by having documented testing and launch plans (de Brentani, 1991), they reduce costs and increase service quality (Dörner et al., 2011), they increase a company's satisfaction with its ability to generate ideas and develop new services (Kelly & Storey, 2000), they help ensure that quality control milestones are met (Kreuzer & Aschbacher, 2011), they help to "frontload" difficulties in the development and operation phases by discovering and overcoming them early in the planning phase (Uchihira, et al., 2008), and they support manufacturing companies in the transition from a product-centric business model to a solution-oriented business model (Costa, Patrício, Morelli, & Magee, 2018).

More broadly, Gebauer, Fleisch, et al. (2005) and Gebauer, Friedli, and Fleisch (2006) see a clearly defined service development process as one of the six success factors which play a critical role in increasing service revenue. de Brentani (1995) shows that detailed processes for developing new services are included in two of her three identified success factors, and that haphazard processes are included in one of her two identified failure predictors. She notes that "new service success (or avoidance of failure) … involve some type of "NSD Proficiency" either through NSD Management or through a formal, stage-gate type of process that ensures a planned approach to the design and introduction of new service offerings" (p.102). For de Brentani (1991) "companies with a formal and detailed new service development process are more likely to

identify optimum design alternatives (which satisfy customers and provide savings for the firm) and to avoid costly errors during launch and delivery" (p. 51). Also discussing the need for clarity in services to avoid issues of quality, Bullinger et al. (2003) says:

> *Difficulties are frequently encountered because the new services created by firms are not clearly defined, there are no unequivocal descriptions of the service contents, the relevant processes and the necessary resources. As a result, efficient and successful implementation of these new services is considerably impeded by an absence of transparency as well as by interface and quality problems. (p. 276)*

It is clearly important that both the company and the customer understand exactly what service is being offered. Also, having clear processes that verify the scope, benefits, and expected outcomes of the service is worthwhile for the company to internally confirm efficiency and to externally ensure that the marketing of the service is fitting to the service being offered and sold.

The common, although not always explicit, thread to these benefits is the reduction of risk and failure by using service design processes. It must be remembered that for manufacturing companies going through the service transition, the service paradox is a failure which leads to the company not being able to successfully fulfil the transition of becoming a service provider (Gebauer, Fleisch, et al., 2005).

The service design process is about the design of individual services and not about the design or organization of the company providing the services. The goal of a service design process is to design a service which is successfully sold to customers (specifically, customers want to buy it and the company makes profit selling it). But as can be clearly seen in the above discussion about structural, cultural, and strategic challenges, success and failure are influenced by more than individual services. Kim, Ishii, Breiter, Naoshi, and Kyoya (2010), for example, do not necessarily see their service design framework as something that directly effects the success or failure of the designed service in particular. Instead they think of it as the tool to use for solving the bigger, fundamental problems faced by manufacturing-based companies during the transition period, which they identify as structural gaps between products and services, conflicts among stakeholders, and poor understanding of the service business. When the bigger, more fundamental problems are addressed, however, it can be a step in the right direction to making the individual services more successful. This connection between the use of service design frameworks and their impact not only on individual services but on the success of the service business as a whole is discussed more in depth in sections 3.3 and 3.5.

3.2.2.2 The Unsystematic Design of Services

Even with the above listed benefits attributed to the use of service design processes, studies are showing that companies are not using methods, frameworks, or processes to systematically design services.

In 1984, Shostack introduced the concept of service blueprinting as a tool to test and refine services before being introduced to the customer in order to prevent that new services are developed and introduced only by trial and error (Shostack, 1984). Martin and Horne (1992) found

that service development, in contrast to product development, “just happens” in an *ad hoc* nature, and 14 of the 16 (non-manufacturing) firms they researched had no clearly defined new service development procedures. Both Kelly and Stone (2000) and Kreuzer and Aschbacher (2011) find that approximately 50% of the firms in their studies had no formal strategy or processes for designing new services. de Brentani (1995) calls a formal set of stages to guide each aspect of the development process “not a common phenomenon in this industrial service scenario” (p. 99). Shulver (2005) points out that while service design literature talks about new service design (NSD) as a deliberate affair in which organizations plan and implement new services in a formal, methodical established process, “there is considerable evidence, prima facie, that the reality is somewhat more chaotic and accidental” (p. 456). It is clear from the literature cited that formal methods, frameworks, or processes are not systematically or consistently used in manufacturing companies for the design of services, and this is seen as one of the major challenges faced by those firms while undergoing the service transition.

3.2.2.3 New Product Development as the Basis of New Service Development

One reason to explain why services are not being designed systematically is because the design processes are often adapted from product design processes and are therefore not applicable or user friendly (Gremyr, Witell, Löfberg, Edvardsson, & Fundin, 2014). Even though manufacturing companies are being told to move into the service sector, research into the design of services has lagged behind research into the design of products (Kim et al., 2010). Also, engineers struggle to design services because they have a different skill set and are familiar with product design processes that are not built for, or particularly applicable to, the design of services (Uchihira, et al., 2008). Because product engineers were suddenly attempting to develop services, it is logical that early studies of NSD success factors borrowed research methods from New Product Development (NPD), and several studies acknowledge that the early understanding of NSD was based off of NPD (Mendes, Oliveria, Gomide, & Nantes, 2017). However, this is not always seen as something negative, as, especially in manufacturing companies where employees are more likely to be familiar with the company’s existing product design processes, using a familiar framework to design services can add a level of comfort, and, if designed correctly, also expand the users outside of manufacturing-based thinking (Kim et al., 2010). Bullinger et al. (2003) take an approach of using already well-developed skills for product design and applying them to help in the successful design of services. They even define “service engineering” as utilizing the engineering know-how from product development to engineer innovative services, which illustrates the connection between the two fields of study.

While the borrowing of research methods and process is not necessarily negative, as the above two examples point out, service development processes, especially in manufacturing companies, are often adapted from product development processes without fully taking into consideration how products and services are different (Gremyr et al., 2014). This is a cause for concern as ill-fitting processes are more likely to produce ill-fitting services, which are more likely to lead to financial failure, and eventually to the Service Paradox. As Goncalves and Saco (2009) say, “while there’s an established consensus that ‘service is different’ from manufacturing, practitioners and experts

alike still insist on employing tools developed on the factory floor for the use in a service culture" (p. 51). Bullinger et al. (2003) agree, saying that especially certain types of services which involve high customer contact cannot successfully have traditional product development methods applied to them, and that the goal of service engineering is instead to combine a number of relevant disciplines in order to develop methods that fit for services, and to avoid simply applying existing product development methods onto services.

Kindström & Kowalkowski (2009) find that NSD models are often designed from existing, likely complex, NPS models and that "business developers in many companies found it necessary to adapt the NSD process to the existing NPD process including existing NPD steps and gates, as well as the existing terminology, in order to find acceptance" (p. 164). This brings attention to both how difficult it can be to introduce services in a company which only has experience with product design, as well as how the product-dominant thinking of manufacturing companies can have negative consequences by failing to properly adjust the design processes to fit services. Wittel, Edvardsson, Meiren, and Schäfer (2016) specifically point out the pitfalls of blindly adapting NPD process to NSD processes, saying:

> *Because manufacturing firms often invest significant resources in the NPD process and engineers are familiar with the stages and gates of this process, the execution of NSD is often integrated into the NPD process. Manufacturing firms add activities and evaluation criteria related to services in the gates of the NPD process to integrate product and service development. This integration often treats NSD in a step-motherly fashion in which the service is developed following a goods logic only suitable for NPD. Consequently, the service is developed as a skunk work, only using the integrated development process to play the political game and pass the gates. (p.44)*

This "playing of the political game" to accomplish the design of services makes the study of the use of methods, frameworks, or processes more complicated, as it makes it difficult to know what employees are actually doing when they design new services. This also fits to the findings of Gremyr et.al, (2010), who point out that having formal service design processes and actually using them can be two very different realities. They blame the ill-fit of the development methods as the cause for this disconnect between what companies say is being done and what is actually occurring backstage.

3.2.2.4 Counter Argument: Service Design Processes Not Shown to be a Success Factor

Although a larger quantity of literature finds that formalized service design processes are a factor in the success of a service business, there are several studies which do not conclude this.

Wittel et al., (2016) show that formalized development processes are helpful for pure service companies but are not shown to be helpful in manufacturing firms, saying that the formal processes and stage-gate models traditionally used for NPD and adapted to NSD are rigid and negatively influence the development of services. Along similar lines, de Jong and Vermeulen (2003) as well as Zomerdijk and Voss (2011) discuss there being a fine line between the benefits of a well-structured process and too much structure which denies the flexibility and freedom

needed to design services. Martin and Horne (1993), although their study is not focused on manufacturing companies, even show that successful firms are slightly more likely to use *ad hoc* design processes as compared to formal design processes. Gremyr et al., (2010) found that all three companies in their study had a formal service design process but that these processes were not actually followed. Therefore, the processes cannot be used to explain success. As touched on earlier, they concluded that the processes were not fitting for service design because they were based on product development processes and therefore not applicable for the design of services.

A commonality between these articles is that they find that using formal service design processes to not be a factor in the success of a company because the processes are simply not fit for service design. de Jong and Vermeulen (2003) call for more research into the use of stage-gate type processes, which originated from the design of products, for the design of services, as enough information does not yet exist. This fits in with what was previously discussed about NPD processes being improperly transferred to NSD processes without validating their applicability to service design.

3.2.2.5 Summary into the Use of Service Design Processes

Several studies find that the use of formal methods, frameworks, or processes in service design is a factor for companies being successful in the service transition and additionally list specific benefits to their use. However, despite the evidence saying that companies should be using these formal design practices, studies find that they are not using them. The reason for this is likely due to a poor fit, which can be caused by various factors.

3.3 SERVICE DESIGN FRAMEWORKS IN THE LITERATURE

Now that the previous section has given an overview of the use of service design processes in manufacturing companies, this can be discussed more specifically in terms of detailed service design methods, frameworks, or processes that can be put to use practically and not just theoretically.

Several authors have used similar research to what was presented in the previous sections to conclude that formal methods, frameworks, or processes are in fact helpful for designing services and have therefore developed their own service design frameworks to address what they found to be the most important aspects in service design. As seen in Figure 4, the cited frameworks differ in the number of steps and the level of detail significantly.

Author	Framework Steps
Costa, Patrício, Morelli, & Magee, 2018	1. Exploration 2. Creation 3. Testing 4. Planning implementation
Dörner, Gassmann, & Gebauer, 2011	1. Definition 2. Development 3. Market launch
Kim, Ishii, Breiter, Naoshi, & Kyoya, 2010	1. Trend analysis 2. Generating/selecting scenarios 3. Extracting functions and requirements from the scenarios 4. Generating solutions and selecting them 5. Building a robust or profitable business model to validate the service business concept
Kindström & Kowalkowski, 2009	1. Market sensing 2. Development 3. Sales 4. Delivery
Kreuzer & Aschbacher, 2011, Kreuzer, Schäfer, & Aschbacher, 2011	1. Strategic analysis 2. Idea generation and idea assessment 3. Business case description 4. Service concept 5. Concept testing and test marketing 6. Service Management
Uchihira, et al., 2008	1. Service Concept Generation 2. Service Scheme Design 3. Transformation Design 4. Risk analysis 5. Evaluation & Refinement

Figure 4. Framework Step Summary (own presentation)

In order to provide more context and understanding about this topic, while keeping the analysis to an appropriate length, three of the listed frameworks will be broken down in more detail to provide a general overview. These frameworks were chosen for a more detailed analysis due to their unique qualities.

The “strategy-based service engineering approach” by Kreuzer and Aschbacher (2011) is the most prescriptive of the frameworks and is the service engineering model of the University of Applied Sciences CAMPUS 02. Kindström and Kowalkowski (2009) developed a generic 4-stage NSD framework that is embedded in NPD processes, focusing on the differences between NSD

and NPD more than other frameworks, which can make it especially useful for manufacturing companies. Dörner et al., (2011) put forward the framework with the least number of stages with their innovation process for services, yet it also provides a unique view by considering the shifting customer roles and the focus from effectiveness to efficiency throughout the stages.

3.3.1 Strategy-Based Service Engineering Approach - The CAMPUS 02 Model

Kreuzer and Aschbacher (2011) begin their article by discussing how companies are facing new economies with changes to markets, customer requirements and competition, and how success comes by being organized strategically in order to enhance customer value. Their answer to being successful in accomplishing these tasks is their service innovation process.

Their traditional stage-gate type service innovation model is broken up into six stages: strategic analysis, idea generating and idea assessment, business case description, service concept, concept testing and test marketing, and service management. All of the stages are defined by specific inputs, recommended methods or tools which fit the individual steps, and specific outcomes or deliverables of the stages. The specific outcomes accomplish the quality control milestones that are needed to move forward within the framework (Kreuzer & Aschbacher, 2011).

Stage 1, strategic analysis, begins with a look at the current product-service system, meaning the current sales portfolio of the company, and how those fit together to detect possible gaps. A SWOT analysis is suggested to be used to review internal and external influences. The goal of this stage is to identify the search field for new services.

Stage 2, idea generation and assessment, begins with generating ideas from the search field discovered in stage 1, and evaluating them. One method of evaluation is if the service idea matches the company's goals and fits within the current product mix.

Stage 3, business case description, looks at the service idea from a market and financial perspective, focusing on market, competition, and customer analysis, including the sales, costs and profits potentially generated by the service idea.

Stage 4, service concept, is the actual development of the service, including resource and process models, coupled with a review of the customer benefits that the service provides.

Stage 5, concept testing and test marketing, is the prototype stage and the step where the service should be thoroughly tested. Additionally, this is the step for marketing activities, meaning that the value that was defined in previous steps is well communicated to customers in marketing material. At this point, employees are also trained on the service delivery process.

Stage 6, service management, is discussed in depth in a later work by Kreuzer, Schäfer, and Aschbacher (2011) and is the continuous improvement process. This is where the service is evaluated for financial success, inefficiencies, and customer dissatisfaction. Improvements discovered in this step must then be made based on the internal and external feedback received.

Kreuzer and Aschbacher (2011) also mention specific benefits to using a frameworks such as theirs, saying that it reduces the time needed from concept to launch, reduces the risk of failure,

supports quality and offers earlier opportunities for continuous improvement, simplifies after sales service, increases profitability, and helps to achieve strategic service goals (p. 187).

Due to this being the CAMPUS 02 framework of choice, it has been developed further over the years. Ehrenhöfer, Kreuzer, Aschbacher, and Pusterhofer (2013) expand the model to include elements of business model design and rename the stages. The true complexity of the framework can be seen in Figure 5, as shown by the arrows indicating where processes may need to be repeated multiple times.

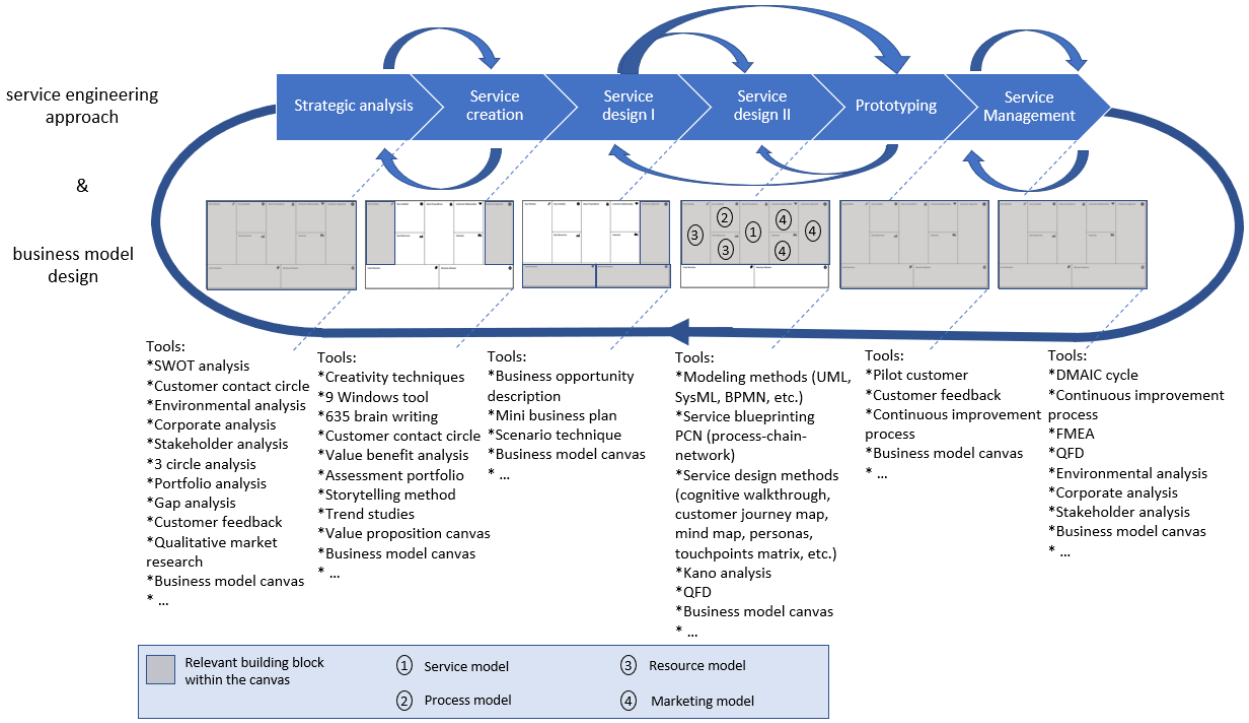


Figure 5. Integrated service and business model development framework (Ehrenhöfer et al., 2013, p. 265)

While it is still a stage-gate type framework at the core, this image clearly shows that service design with this framework is not as simple as a linear design process and that services have to be continuously managed.

Ehrenhöfer et al. give specific recommendations for which tools may be useful to companies inside the service design process. However, Kreuzer and Aschbacher (2011) also point out that the tools used by each company may be unique, saying:

> *It is important to configure a customised best-fitting toolbox for each company. Therefore, a detailed evaluation of each of these tools is necessary to ensure the right choice of tools. Note that from the applicable methods and tools one already being used is to be selected. The great advantage is that one is familiar with the method and the skills already exist therefore it is quicker than applying a completely unknown and new method. (p.183)*

Since this model is so detail rich, it provides a good starting point for companies who want to implement a service design framework and are looking for a prescriptive, step-by-step solution to design services in a systematic way.

3.3.2 A Four-Stage Framework of NSD

Kindström and Kowalkowski (2009) developed a generic four-stage framework which is geared specifically towards manufacturing companies.

Their research focuses on the difference between and explanation of NSD and NPD models more deeply than the other frameworks cited above. The four stages of the model are market sensing, development, sales, and delivery. Kindström and Kowalkowski relate their framework directly to the organizational challenges that they found companies face in the service design process, as can be seen in Figure 6.

Stage	NSD specific traits (compared to NPD)	Critical aspects	Organizational challenges
Market sensing	More sources for innovation; both local and central as well as external and internal. Innovation coming from local decentralized actors	Balancing exploration and exploitation, and local and central innovation and learning. Structuring the existing service portfolio	Many companies supply unstructured services and lack the capacity to sense market opportunities
Development	Significantly more customer input and interaction. Investment patterns are different	Designing NSD process with customer involvement, not only blueprinting complex NPD models	Most case companies have problems getting investment decisions and commitment, e.g. due to finding illustrative and convincing business cases
Sales	Technical attributes are not in focus. Customer centric rather than product centric process is mainly on value-in-use rather than on value-in-exchange	Developing measures and sales tools. Changing existing mindset, norms, and values	Sales personnel are biased towards product sales and often lack competence and/or will to sell service offerings
Delivery	People intensive and co-produced. Relationship intensive/enhancing	Making service offerings visible for customers used to products	Many companies lack the necessary service infrastructure including technology

Figure 6. Four Stages of NSD process and managerial implications (Kindström & Kowalkowski, 2009, p. 162)

Stage 1, market sensing, is about looking at both internal and external environments. A suggested way to start is by looking at the existing service portfolio. Kindström and Kowalkowski point out that the history of supplying services free of charge as part of product sales means that "this already existing service portfolio is often not managed in a structured and formalized manner, and consequently, these services are not necessarily visible in the companies' financial statements and performance measurement systems" (p. 163).

Stage 2, development, is described by Kindström and Kowalkowski less by what this stage entails for NSD, but more how it is different from the development stage of NPD. This stage of NSD requires "intensive involvement of the customer and user throughout the complete process" (p. 164) and that due to the "greater number of different internal functions that are generally involved… [The] NSD process demands a greater focus on achieving internal consensus, since

there are numerous local actors involved in the actual delivery, and by extension the production, of the service" (p. 164).

Stage 3, sales, is essentially about the communication of value. Kindström and Kowalkowski (2009) explain this by saying:

> *NSD research traditionally put relatively little emphasis on the actual sales stage and the following delivery stage, compared to the development process, despite the fact that in many industries selling services are more complex due to difficulties visualizing the value created. Among other things, this is due to the intangibility of the service and also the inexperience of both supplier and buyer, in terms of understanding value created. (p. 164-165)*

This means that both the customer and the sales team need to understand what value the service brings, which will require the development of tools and methods to aid in selling (p. 165). Due to this, Kindström and Kowalkowski recommend having a dedicated salesforce for the service organization instead of having a traditional product sales team who simply add services onto their sales responsibilities.

The fourth and final stage of the framework is delivery. Kindström and Kowalkowski (2009) point out that this stage in NSD is the most different from NPD, and give ideas for making the service visible to the customer, saying:

> *In this stage, it is critical to be able to point at benefits achieved in monetary terms. However, it is also vital to address intangible aspects in order to increase the customers' positive perception of the provider before the current agreement is re-negotiated and/or a new procurement process starts. This is particularly challenging if the service is of a character that it is not explicitly noticed as long as it works (e.g. delivery of a continuous supply or a full-service rental agreement) but only receives attention during failure. (p.166)*

In their research, Kindström and Kowalkowski found that NSD processes are concentrated primarily on the development stage, similar to NPD, but found that managing all four stages is critical to success. They also point out that the four stages are overlapping and that the individual steps will differ notably depending on the company and market situation. Additionally, while an NSD process is needed, it "must not be conducted only as a centrally managed, 'clinical' development project with rigid structures, phases and gates" (p.162) and that companies must be able "to have the capability to also sense and seize emerging innovation opportunities in a less formal, *ad hoc* manner" (p. 168).

Another difference between NPD and NSD processes is resource utilization, with Kindström and Kowalkowski pointing out that NSD requires less investment in Stages 1 and 2 but significantly more investment in Stages 3 and 4, which must be taking into consideration for planning.

While this framework offers a general template for users, it is not to be used as a stage-gate type framework, as the authors believe that maintaining flexibility is vital in service design.

3.3.3 Innovation Process for Services

Through their research, Dörner et al., (2011) name five managerial deficiencies that make service innovation difficult to accomplish: failure to protect services by delivering the whole customer experience (p. 38), the responsibility for service development being unclear (p. 39), the innovation process not being systematic (p. 39), the customer having too little input (p.40), and the fact that bad ideas are not consistently eliminated (p.40). Their suggested method for countering these deficiencies is their innovation process for services, seen in Figure 7.

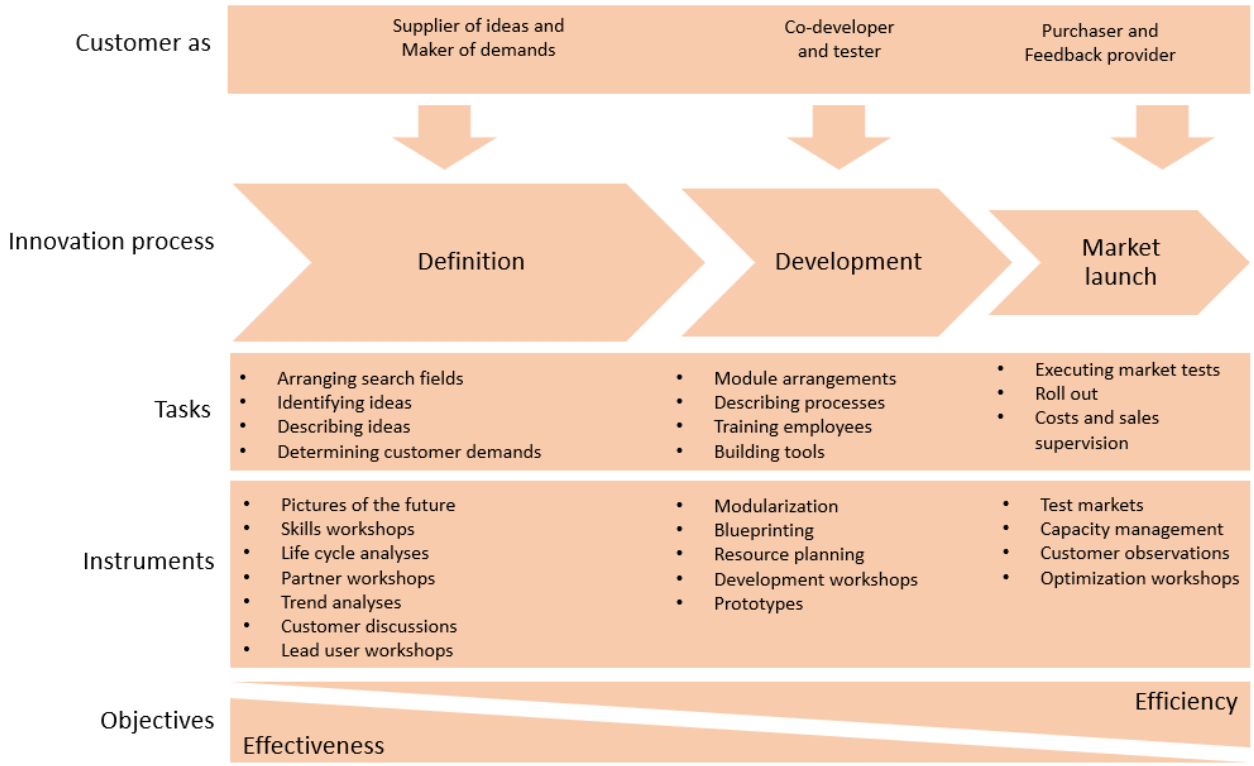


Figure 7. Innovation Process for Services (Dörner et al., 2011, p. 41)

The first stage, definition, should answer the question "what do companies want to develop and for what target group?" (p.42), focusing on what service ideas will satisfy customer requirements.

The second stage, development, contains three sub-steps: definition of the service package, development of the service process, and creation of the service prerequisite (p. 43). The goal of this stage is to have a cohesive, smooth service, and includes blueprinting, as well as service delivery training in order to accomplish this goal.

The third and final stage, market launch, includes fine-tuning of the offer and "service multiplication", meaning to ensure that the service is consistent regardless of who delivers it to which customer. Additionally, once the customer receives the service, their feedback can be used for optimization of the service.

For Dörner et al., "…innovative services represents an opportunity to reduce price erosion in the core business. However, this applies only if the new services are not pure cost drivers or promotion gags, but create a genuine increase in value for the customer" (p. 45). Therefore, their

framework is designed to make sure that value for the customer is attained. Additionally, a benefit for them of using such an innovation process is the possible reduction of development costs and increase of service quality.

What is unique about this framework is the attention paid to the shifting role of the customer across the phases and to effectiveness and efficiency.

This framework is very simple in its format but provides a unique perspective to service design processes that can be easily adapted to individual companies.

3.4 Establishment of a Generic Three-Step Framework

Now that there is a detailed understanding of three very different service design frameworks, a pattern starts to emerge and further analysis can lead to the frameworks being broken down into three general steps, namely, pre-analysis, development and testing, and implementation, sales and management. This is not a proposal for a new framework for companies to use, but instead shows connections found in the literature that are useful for understanding what is at the core of service design methods, frameworks, or processes.

3.4.1 Step 1: Pre-Analysis

The first step in many of the frameworks, whether called “exploration” (Costa et al., 2018), “definition” (Dörner et al., 2011), “trend analysis” (Kim et al., 2010), “market sensing” (Kindström & Kowalkowski, 2009), “strategic analysis” (Kreuzer & Aschbacher, 2011), or “service concept generation” (Uchihira, et al., 2008), is a pre-analysis focused on both internal and external factors that will have an influence on what services are needed for a well-rounded service portfolio. This includes an analysis of the current service offerings and the customer market. This phase is primarily about information gathering and strategy formation and provides both a starting point for and a roadmap to the next two steps.

3.4.2 Step 2: Development and Testing

The next step, development and testing, is the largest and most detailed step which encompasses the full development cycle of the service itself. It’s goal is to generate ideas from the outcome of the first step (Kreuzer & Aschbacher, 2011), making sure to fully consider unmet customer needs and core competencies of the company (Kim et al., 2010). Additionally, this is the step to verify if the new service meets the strategy and business goals of the company (Ehrenhöfer et al., 2013), to analyze potential sales, costs and profits (Kreuzer & Aschbacher, 2011), to develop a prototype (Kreuzer & Aschbacher, 2011), to get significantly more customer input (Kindström & Kowalkowski, 2009), and to receive the final management go or no-go decision to launch the service (Uchihira, et al., 2008).

3.4.3 Step 3: Implementation, Sales and Management

The third step is implementation, sales and management. This includes proper internal and external marketing to ensure that the value and benefits of the new service is understood (Kindström & Kowalkowski, 2009), to train employees (Dörner et al., 2011; Ehrenhöfer et al., 2013; Uchihira et al., 2008) on the service delivery process, the roll out of the service (Dörner et al., 2011; Kreuzer, Schäfer, & Aschbacher, 2011), the sale of the service to the customer, and also the continuous evaluation and improvement of the service (Kreuzer, Schäfer, & Aschbacher, 2011). It is important to mention that a part of this phase also includes going back to the pre-analysis stage to ensure that companies are not becoming complacent and that the service is still fitting the needs of the customer and company (Kindström & Kowalkowski, 2009) as time goes by.

3.4.4 Tools

In addition to the steps, many of the framework authors also give suggestions as to which tools can be used to assist companies in accomplishing the steps.

In the pre-analysis step, Kim et al. (2010) suggests the VOX method, which considers the voice of society, technology, competition and business, Kreuzer and Aschbacher (2011) suggest a SWOT analysis to consider internal and external factors which influence the service offering, and Costa et al. (2018) suggest internal workshops with several departments to get a clear view of the current situation.

The development and testing phase can benefit from the use of service blueprinting (Dörner et al., 2011), the Value Proposition Canvas and Business Model Canvas, as well as customer journey mapping (Ehrenhöfer et al., 2013). Service blueprinting provides a visual representation of each stage of the delivery process to ensure that the process is smooth and doesn't have fail points (Shostack, 1984). Customer journey maps focus on the customer's experience with the service, including their emotional reactions to each touchpoint (Stickdorn & Schneider, 2011) and can therefore help in the fine design of a service and its processes. The Business Model Canvas helps a company evaluate its business model for the new service and makes sure that the inputs and outputs of the service are clear (Stickdorn & Schneider, 2011), while the Value Proposition Canvas, an offshoot of the Business Model Canvas, is used to make sure that the value and benefit of the service is meeting the needs of the customer. Additionally, idea generation tools such as brain writing (Ehrenhöfer et al., 2013) or "Pictures of the Future" (Dörner et al., 2011) can also be used in this stage.

The suggestion of tools helps to make the frameworks more user-friendly and applicable to companies by providing examples of how to accomplish the stages.

3.4.5 Summary of Frameworks

Various service design frameworks have been presented by researchers. However, as they are often based on different research and trying to solve different problems, the frameworks differ in the number of stages, details, prescriptiveness, as well as suggested tools that help with the accomplishment of each stage. Some authors warn of applying frameworks broadly, while others seem to think that they can be generally applicable to any company.

Even though the stated goals of the use of frameworks differ by author, the use of a framework in general can be seen as a way to keep a company on track with their service design, to make sure that all of the boxes are checked and that the service idea is properly vetted. This, in theory, makes the service more likely to succeed. This connection between service design frameworks and their contribution in solving challenges and increasing the likelihood of success will be discussed in the next section.

3.5 Linking Design Frameworks to Success Factors and Challenges

Once multiple frameworks are analyzed and broken down into a generic three-step framework, it is easier to see how the use of service design methods, frameworks, or processes relate to other success factors identified in the service transition phase. Furthermore, their connection to the limitation of challenges is now visible.

Neu and Brown (2005) and Gebauer, Bravo-Sanchez, and Fleisch (2008) all show that orientation towards markets is a success factor for the service transition, which is addressed in the pre-analysis step of a service design framework. Neu and Brown add that successful B2B development in goods-dominant firms requires alignment between environment (meaning markets), strategy, and factors of organization. This is also considered in the pre-analysis step of a service design framework.

Gebauer and Friedli (2005) say that certain management and employee behaviors can impact the success of the service transition. Specifically, the “value-added” service awareness of managers and employees, the manager’s understanding of the changing of roles from customer support to total business management, and the employee seeing their role change from selling products to providing services all impact success. These kinds of tasks are done in the development and testing step, where the focus is on engineering a service that truly has value and fits the needs of the customer. Bettencourt and Brown (2013) also agree that a focus on the job that a customer needs to get done (part of the Value Proposition) increases the likelihood of product-dominant companies to be successful, but go even further than Gebauer and Friedli, who say that employees should change their role from selling products to providing services, by saying that companies need to instead shift the focus onto helping customers accomplish their jobs, regardless if products or services are at the center of the solution.

As mentioned above, the struggles that a manufacturing company faces in the service transition can be broken down into structural challenges, cultural challenges, and strategic challenges.

While the use of service design frameworks does not seem to be connected with the structural challenges, as can be seen in Figure 8, their use can have a positive effect on many of the cultural and strategic challenges.

Challenge Category	Author	Challenge	Connection to Framework	Notes
Cultural	Bettencourt and Brown, 2013	Company culture that is not open to service innovation	--	--
Cultural	Parris, Bouchet, Peachy, and Arnold, 2016	The company has difficulties handling change	The whole service design framework	A fitting framework should help the change feel more controlled.
Cultural	Neu and Brown, 2005	The lack of intra-firm collaboration	The whole service design framework	A framework can mandate interaction between departments.
Cultural	Uchihira, et al., 2008	Insufficient experience to manage services	The whole service design framework	The framework provides a template for introducing and managing new services.
Strategic	McDonough III, Zack, Lin, and Berdrow, 2008	A lack of strategic alignment in the company	Pre-analysis step; the whole service design framework	The pre-analysis phase takes strategy into consideration; framework should be designed to fit company strategy.
Strategic	Gebauer, Friedli, Fleisch, and Ebeling, 2014	A lack of market knowledge	Pre-analysis step	Research into markets is crucial to this phase.
Strategic	Kindström and Kowalkowski, 2014	Improper business model adjustment	Development and testing step	A strong development and testing step will consider changes in business models.
Strategic	Ulwick and Bettencourt, 2008	Disagreement in the company about customer needs	Pre-analysis step	A thorough pre-analysis should clear up customer needs.
Strategic	Martin and Horne, 1993	The failure of the service offering to fit the current business	Pre-analysis step; development and testing step	The pre-analysis and development and testing steps work to fit the service to both the customer and the company.
Strategic	de Brentani, 1995	The lack of a formal, planned approach to the design of new services	The whole service design framework	The framework is a formal approach to service design.

Figure 8. Linking Challenges with Frameworks (own presentation)

Based on the review and analysis of the literature, it can be concluded that the use of methods, frameworks, or processes in the design of services, while being attributed as a factor in success by several authors, should actually be looked at from a different angle. The use of these methods, frameworks, or processes, if done properly, have the ability to address a variety of challenges that are encountered in the service transition, which can be interpreted as their actual usage.

For Kim et al. (2010), the struggle they face is that product engineers are familiar with product design frameworks and need a similar framework for services as a starting point to better understand the service business. Therefore, they use a known product design model and redesign it to better fit the design of services, because this model is specifically developed for engineers in a manufacturing company who have little service experience. For Costa et al. (2018), the main challenge is the balancing of the customer verses the firm perspective for designing new services. Therefore, the use of their framework ensures that both views are considered. Kreuzer and Aschbacher's (2011) answer to implementing a service strategy, found in other research as being the main success factor in the service business, is a framework heavy with stage-gates and quality checkpoints to ensure the strategy is being met throughout the whole service design cycle.

The positive impact of methods, frameworks, or processes depend on how they are applied and if it helps to solve the underlying struggles the company is facing with the service transition. This means that the universal application of methods, frameworks, or processes could be counterproductive, as different types of services may need different processes or levels of formality. Jaakkola et al. (2017), for example, discuss how companies need to be critical of applying generalizations about service design unilaterally, saying "when managing NSD, the models, methods, and tools used should be selected depending on the needs and challenges linked to the service type to be developed" (p.341).

However, going one step further could also be useful here, and based on the literature review, it can be said that the methods, frameworks or processes for service design should be selected not only for the type of services being developed but also depending on the challenges that the company is facing in successfully introducing new services into their existing business models.

Regardless of the benefits found by companies having formal methods, frameworks, or processes in service design, if companies are not using them, they have no opportunity to work. So, even though Gebauer et al. (2006) found that the 5 companies in their study which are struggling to achieve high service revenue did not have clearly defined service development processes and the 5 successful companies did, it can not necessarily be concluded that the companies were using the service development processes. As Gremyr et al., (2010) find in their study, simply having methods, frameworks, or processes in place does not necessarily mean that they are being used. Similarly, in the study of Martin and Horne (1993), it is not actually asking if firms *use* specific processes, but instead wants to know if they have a formal innovation process in place. Approximately 58% answer this question with no. In addition, while they do not find support that a formal new service development process has an effect on success, they do show that "successful firms, while not having a written statement of the strategic arena within which they will develop new services, nevertheless fit their offerings with current business more than unsuccessful firms" (p. 61). This supports the conclusion that it is not necessarily the use of methods, frameworks, or processes in service design that is directly related to success. Instead, it can be assumed that the use of methods, frameworks, or processes can be a way to address other challenges that companies face.

Again, based on this analysis, the use of methods, frameworks, or processes in service design should be seen as a tool to address and reduce the challenges that companies encounter in the

service transition. Therefore, methods, frameworks, or processes should be customized to fit the struggles of the companies, which in theory will increase their usage. This of course also means that the methods, frameworks, or processes for designing services cannot be simply adjusted from the company's methods, frameworks, or processes for designing products but actually need to be properly developed for services specifically. Additionally, the best frameworks will do no good if they are not followed, so an across-the-board analysis should be done to make sure that they are correct for the individual company using them.

3.6 SUMMARY

Manufacturing companies have been told to integrate service offerings into their sales portfolios in order to meet the economic demands of increasing revenue, meeting the customer demand for services, and staying competitive in the market (Oliva & Kallenberg, 2003). This transition into the service market, however, has its fair share of structural, cultural, and strategic challenges that companies face during this time. Although several studies find that the design of services does not follow formal processes but are instead being developed *ad hoc* (de Brentani, 1995; Kelly & Storey, 2000; Martin & Horne, 1992; Shostack, 1984; Shulver, 2005), the use of formal service design methods, frameworks, or processes is listed as a success factor for companies in the service transition (de Brentani, 1991; de Brentani, 1995; Dörner et al., 2011; Gebauer, Fleisch, et al., 2005; Gebauer, Friedli, et al., 2006; Kelly & Storey, 2000; Kim et al., 2010; Kreuzer & Aschbacher, 2011). However, some studies find that formal service design processes do not provide enough flexibility for services (de Jong & Vermeulen, 2003; Wittel et al., 2016; Zomerdijk & Voss, 2011), that they are too deeply based in NPD processes (Gremyr et al., 2010; Wittel et al., 2016), or that there is simply no connection between using or not using formal processes in the success or failure of firms (Martin & Horne, 1993). Upon taking a closer look into the service design frameworks presented in the literature, a generic three-stage service design framework was developed to be used as a generalization of the stages which are commonly found in service design frameworks. These three stages, pre-analysis, development and testing, and implementation, sales and management, can be connected to the cultural and strategic challenges companies are facing in the service transition, concluding that frameworks themselves are not a success factor in this period. Instead, they help the chances of success by systematically addressing other cultural and strategic challenges companies face in the service transition and in service innovation.

4 CASE STUDY FINDINGS

After a short introduction to the survey used in the case study, the findings of the study will be shared in section 4.2. The majority of the analysis of the findings, however, will be done in section 4.3

4.1 INTRODUCTION TO CASE STUDY

The survey used for the case study was sent to 15 students participating in the 2019/2020 academic year of the Campus 02 “Service Engineering and Management” MBA program (not all of whom are employees of qualifying companies). Additionally, 10 other employees of manufacturing companies with a presence in the Styrian market who sell services were also asked to participate. All contacted people were encouraged to forward the survey link to other companies or colleagues within their company, in order to increase the number of participants. In total, 16 participants responded to the survey during the case study timeframe, which was the end of March through mid-June 2020. Of these 16, three were disqualified due to a negative answer at the disqualification question. Therefore, the results presented in the following sections represent the answers of the 13 valid respondents. The 13 respondents work for nine different companies and, as a result, four of the companies are represented by the answers of two different employees. The average time needed to complete the survey was approximately 14 minutes, which was slightly above the estimated completion time of 10 minutes.

The survey was designed with the online platform SurveyMonkey (http://www.de.surveymonkey.com). Participants were able to view and fill out the survey by using a provided weblink. The results were also generated from the same platform.

The goal of the survey was to find out how employees involved in service design in manufacturing companies with a presence in the Styrian market interact with and perceive the methods, frameworks, or processes for designing services, and how this relates to the biggest challenges they face in service innovation.

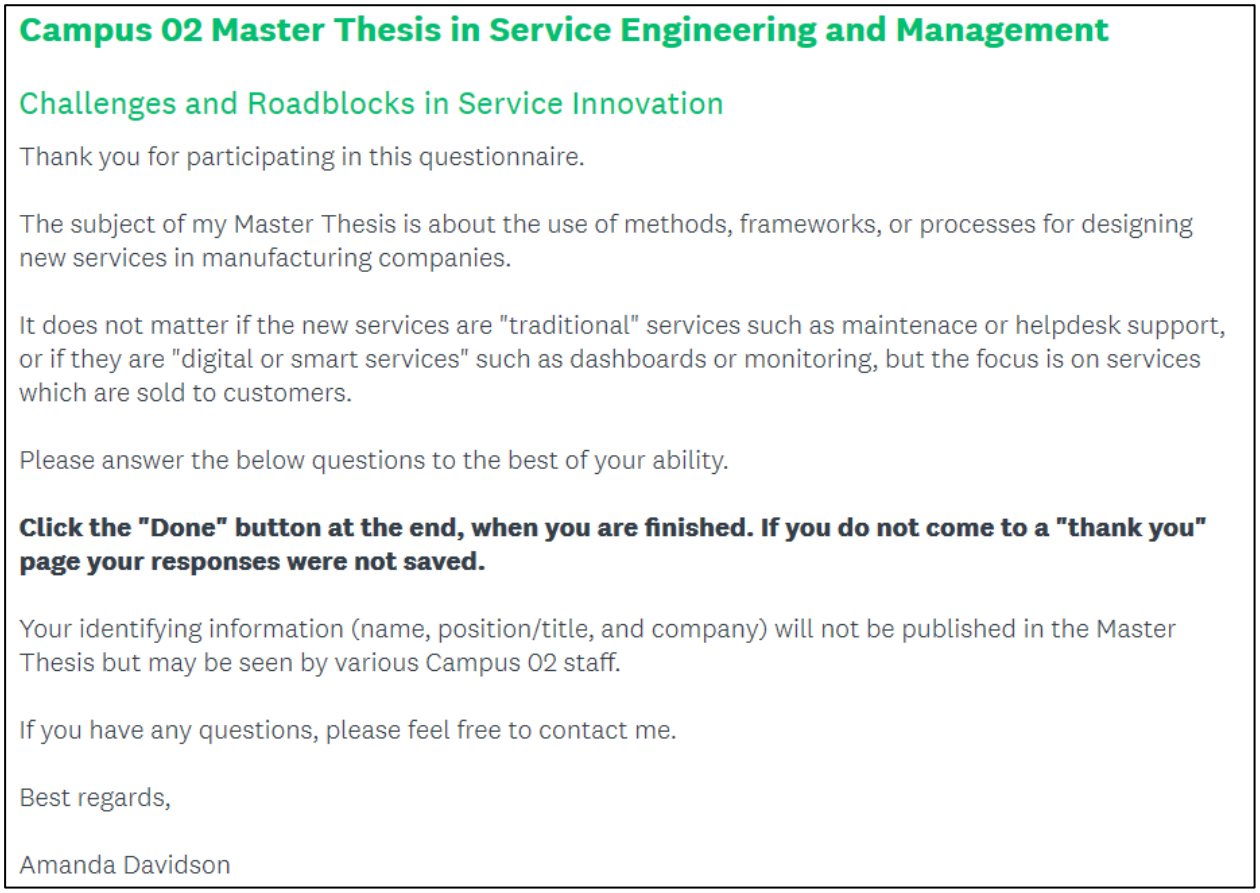
The resulting data was coded and analyzed using IMB SPSS Statistics (Version 26) analytics software.

4.2 SURVEY AND RESULTS

The beginning of the survey was an introduction to the case study subject, as seen in Figure 9. This provided a short background on the purpose and topic of the survey and explained its use in this case study. Additionally, it gave a definition of services as including traditional as well as digital or smart services.

A note was added to the introduction about the” done” button at the end of the survey after a participant reached out to say that they were not sure if their responses were recorded or not.

This note was added in an attempt to decrease the chances of losing responses because participants did not fully complete the survey by clicking “done”. Unfortunately, there is no way to know if this had an effect or not.



Campus 02 Master Thesis in Service Engineering and Management

Challenges and Roadblocks in Service Innovation

Thank you for participating in this questionnaire.

The subject of my Master Thesis is about the use of methods, frameworks, or processes for designing new services in manufacturing companies.

It does not matter if the new services are "traditional" services such as maintenace or helpdesk support, or if they are "digital or smart services" such as dashboards or monitoring, but the focus is on services which are sold to customers.

Please answer the below questions to the best of your ability.

Click the "Done" button at the end, when you are finished. If you do not come to a "thank you" page your responses were not saved.

Your identifying information (name, position/title, and company) will not be published in the Master Thesis but may be seen by various Campus 02 staff.

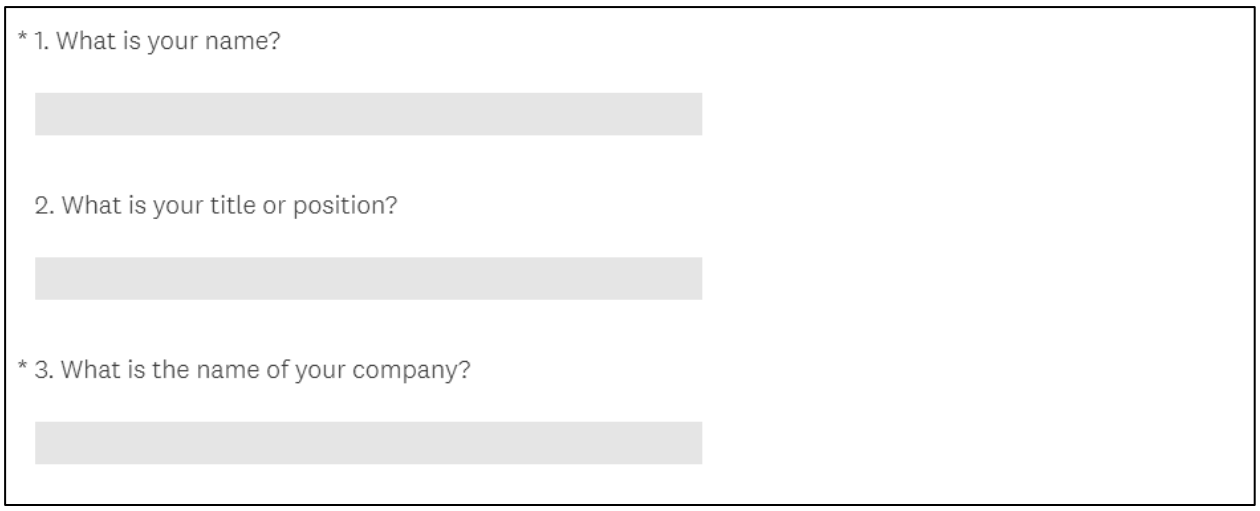
If you have any questions, please feel free to contact me.

Best regards,

Amanda Davidson

Figure 9. Survey Introduction

Questions 1 through 3, as seen in Figure 10, were for information purposes and are kept anonymous in the case study results.



* 1. What is your name?

2. What is your title or position?

* 3. What is the name of your company?

Figure 10. Survey Questions 1-3

The company name was coded and used in parts of the analysis, but the participating companies are not named in this paper. This was important, as one participant specifically expressed concerns in answering that their company was not using a service design framework as this was not something that the participant wanted shared openly. It can be published, however, that most respondents were in various levels of management in their perspective companies, and the responsibilities of the respondents included the design of both traditional and smart services.

Question 4, as seen in Figure 11, is a disqualification question, meaning that if a participant said that the design of new services was not a part of their job responsibility their survey results were removed from the analysis. It was vital to the applicability of the results that only participants who are actively involved in the design of new services are a part of the analysis. This is because they are the ones who are able share their biggest challenges in service innovation and their interactions with service design methods, frameworks, or processes.

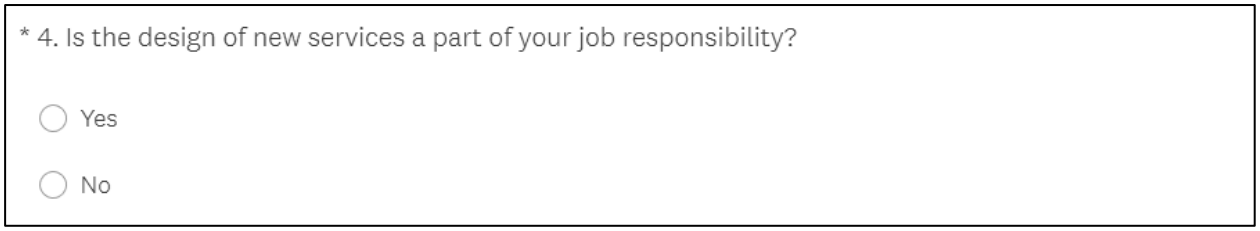


Figure 11. Survey Question 4

As previously mentioned, three of the 16 participants answered “no” and were therefore disqualified from the case study, which leads to only 13 surveys being analyzed and presented in this paper.

Question 5, as seen in Figure 12, aims to find out if employees think that the design process for new products in their company is different from the one for new services. The literature review found that service design methods, frameworks, or processes are often adapted from product design and therefore not fitting for the design of services (Gremyr et al., 2014).

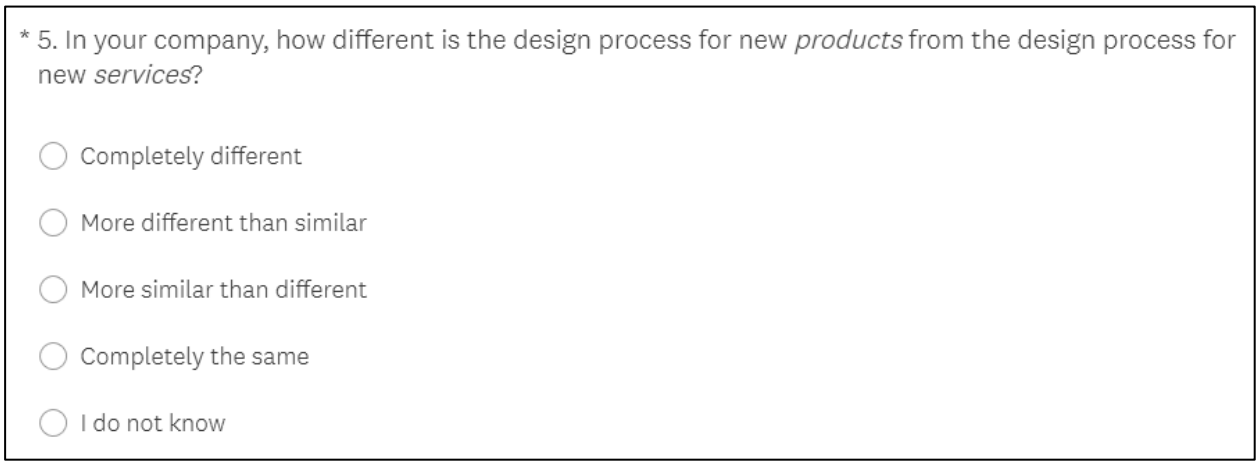


Figure 12. Survey Question 5

Although this case study does not shine light on the origins of the service design methods, frameworks, or processes used in the companies or directly touch on how fitting the companies methods are, it does show that 10 of the 13 respondents, 77%, said that service and product

design processes were either “Completely different” or “More different than similar” in their company, which is shown in Figure 13.

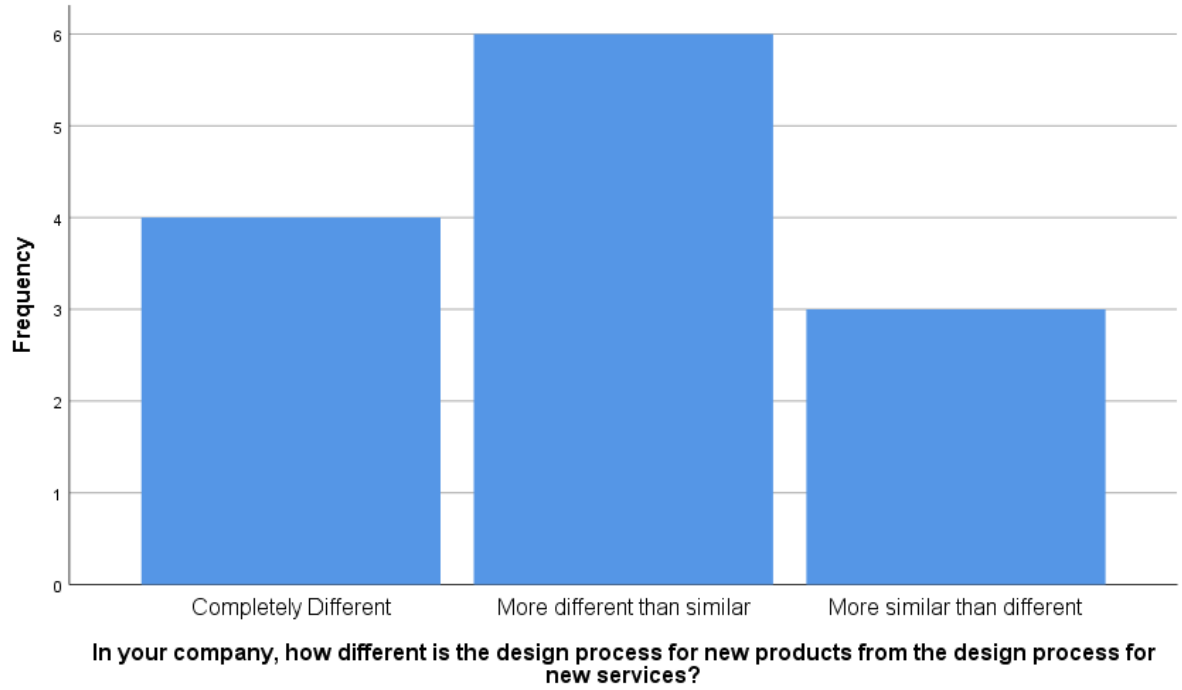


Figure 13. Results of Survey Question 5

Question 6, as seen in Figure 14, asks if the respondent’s company has documented methods, frameworks, or processes for designing new services.

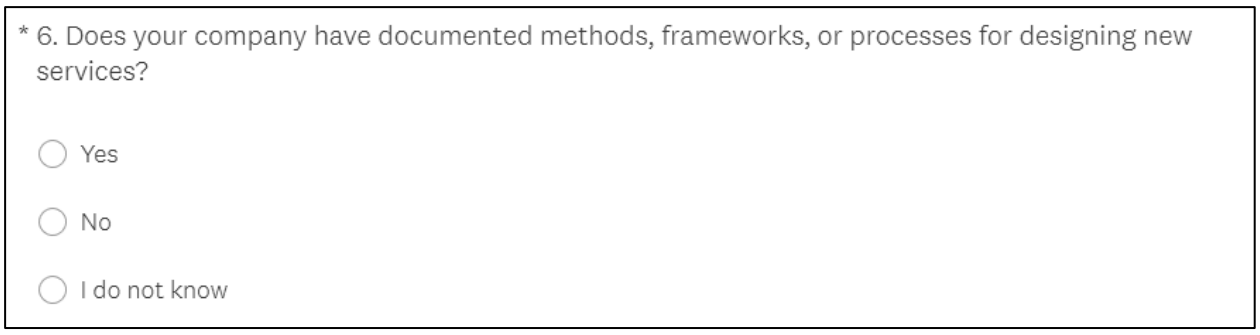


Figure 14. Survey Question 6

Eight of the respondents, 61%, said yes to this question, which is above what the studies which directly addressed this topic in the literature review found. One respondent said that they did not know if their company had documented methods, frameworks, or processes for service design, which shows that in this company there is either poor communication around the topic of service design, or that the methods, frameworks, or processes are loosely regulated and unsystematic. This is seen in Figure 15.

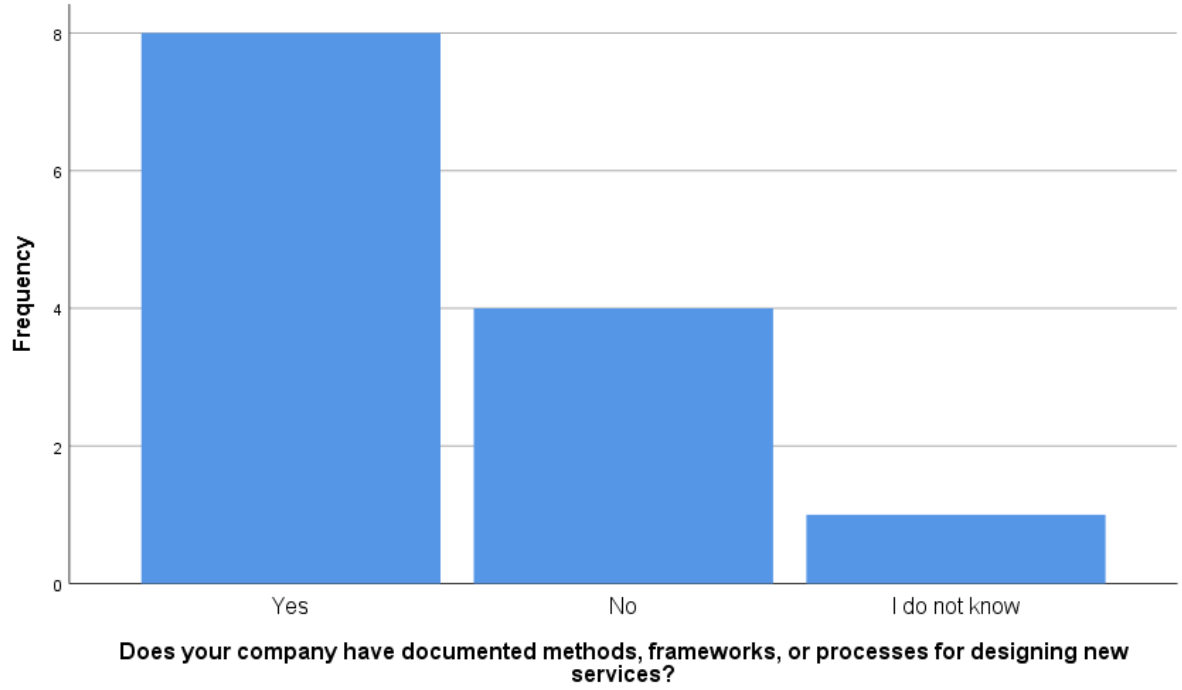


Figure 15. Results of Survey Question 6

Question 7, as seen in Figure 16, asks how important methods, frameworks, and processes are in designing new services. This will help determine if participants feel that the use of methods, frameworks, or processes are useful to their work in service design.

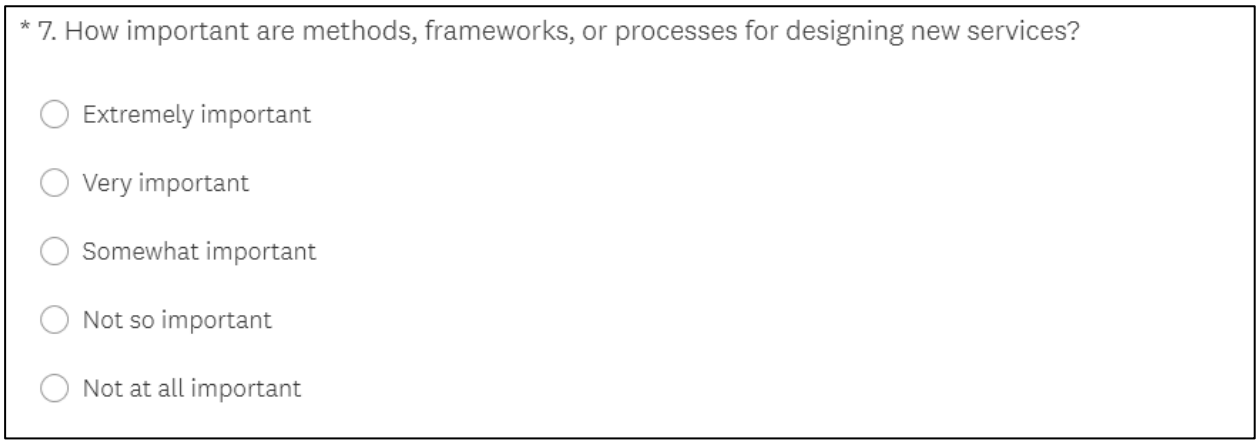


Figure 16. Survey Question 7

Nine of the 13 respondents, 69%, responded that methods, frameworks, or processes were “Very important”, as can be seen in Figure 17. This means that even when the company the respondent works for does not use methods, frameworks, or processes for service design, the respondent is likely to think that the use of them is important and beneficial to their work.

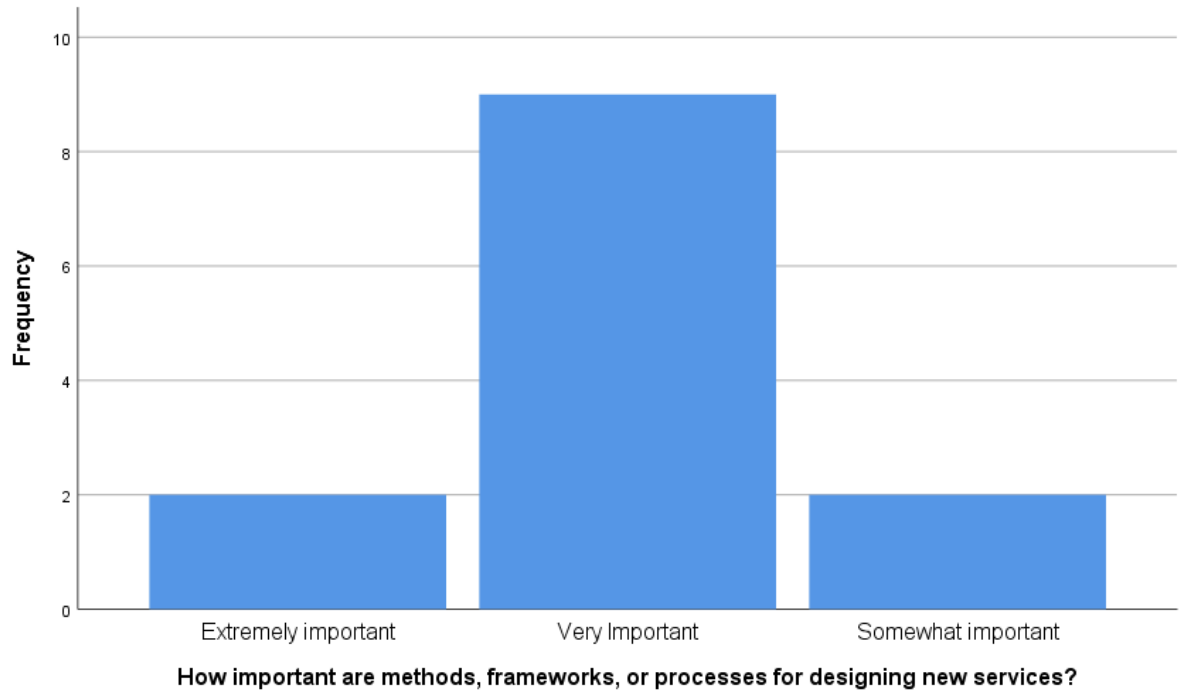


Figure 17. Results of Survey Question 7

Question 8, seen in Figure 18, asks how often the respondents use methods, frameworks, or processes for the design of new services. This will show how consistently the employee uses methods, frameworks, or processes, which can be an indicator of how strictly the company enforces their use, or of how the respondent feels about the applicability of the methods, frameworks, or processes used.

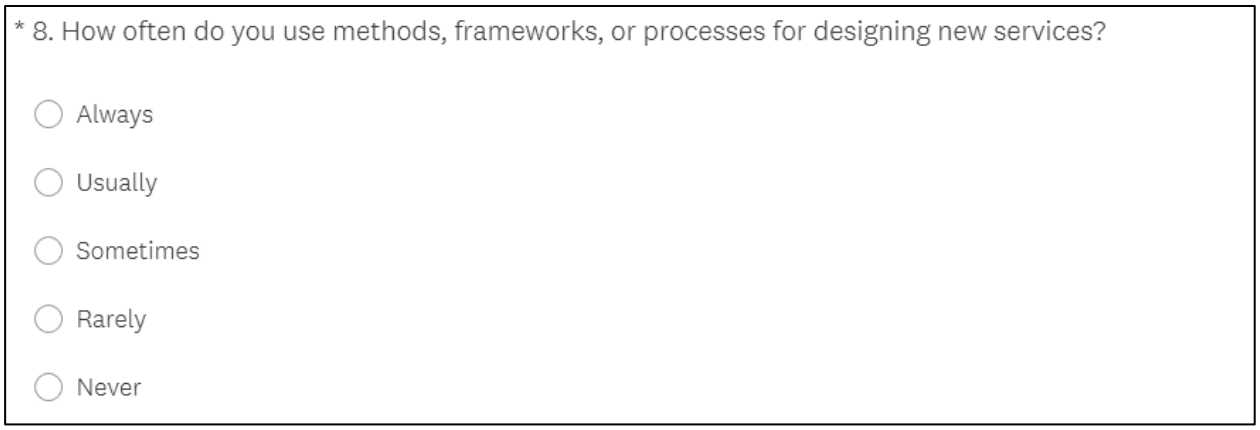


Figure 18. Survey Question 8

10 of the 13 respondents, 77%, said either “Usually” or “Sometimes” while only one respondent reports that they “Always” use methods, frameworks, or processes for the design of new services. This is seen in Figure 19. Although these answers are not quantifiable, they do show that the use of methods, frameworks, or processes is common, but not consistent or systematic, and that at least some services are being designed without the use of methods, frameworks, or processes in most of the companies represented in the case study.

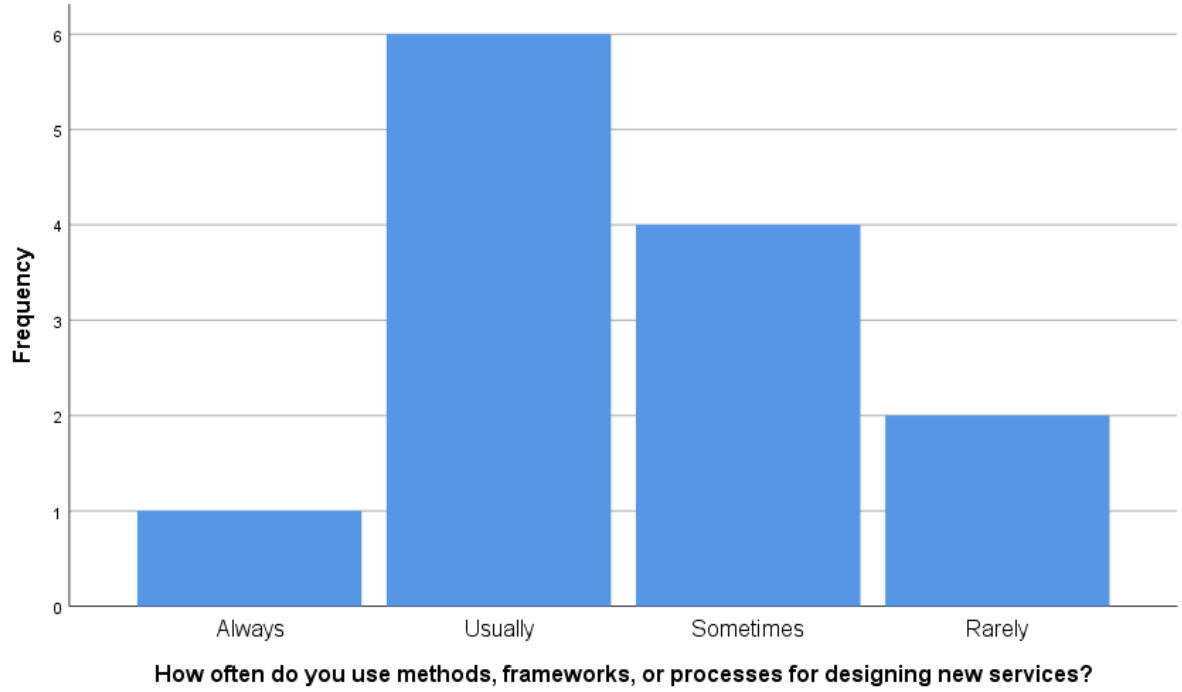


Figure 19. Results of Survey Question 8

Question 9, as seen in Figure 20, asks the participants what methods, frameworks, or processes they use for designing new services. This was included in the survey as an optional question as the goal was not to find out what methods, frameworks, or processes employees of manufacturing companies in the case study were actually using, but to instead find out how they feel about them. The goal of this question was to get the participants thinking directly about the methods, frameworks, or processes used for service design so that they were prepared to answer the next question in the survey. Despite this question not being required, 11 of the 13 respondents choose to answer it.

The answers given to this question varied to a high degree and gave some useful insight to service design in these companies. This will be discussed more in section 4.3.5.

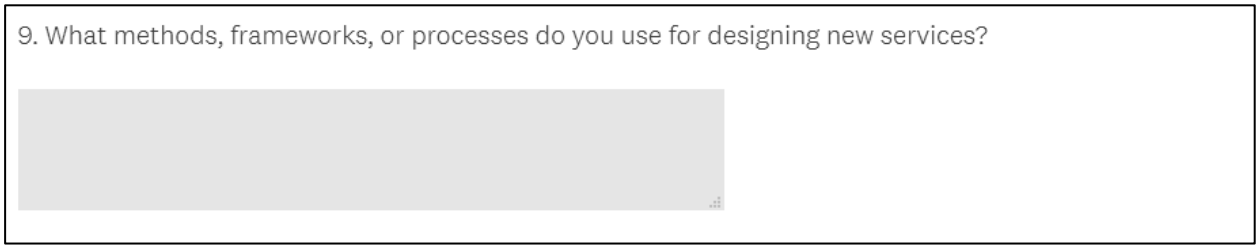


Figure 20. Survey Question 9

Question 10, as seen in Figure 21, asks participants to select from a choice of options that describe their opinions about methods, frameworks, or processes for designing new services. It was designed so that participants could select as many of the options that applied to them. This question is core to the case study and was placed after the previous question asking participants to name the methods, frameworks, or processes they use for service design so that those were fresh in their mind when they gave their opinions about those methods, frameworks, or processes.

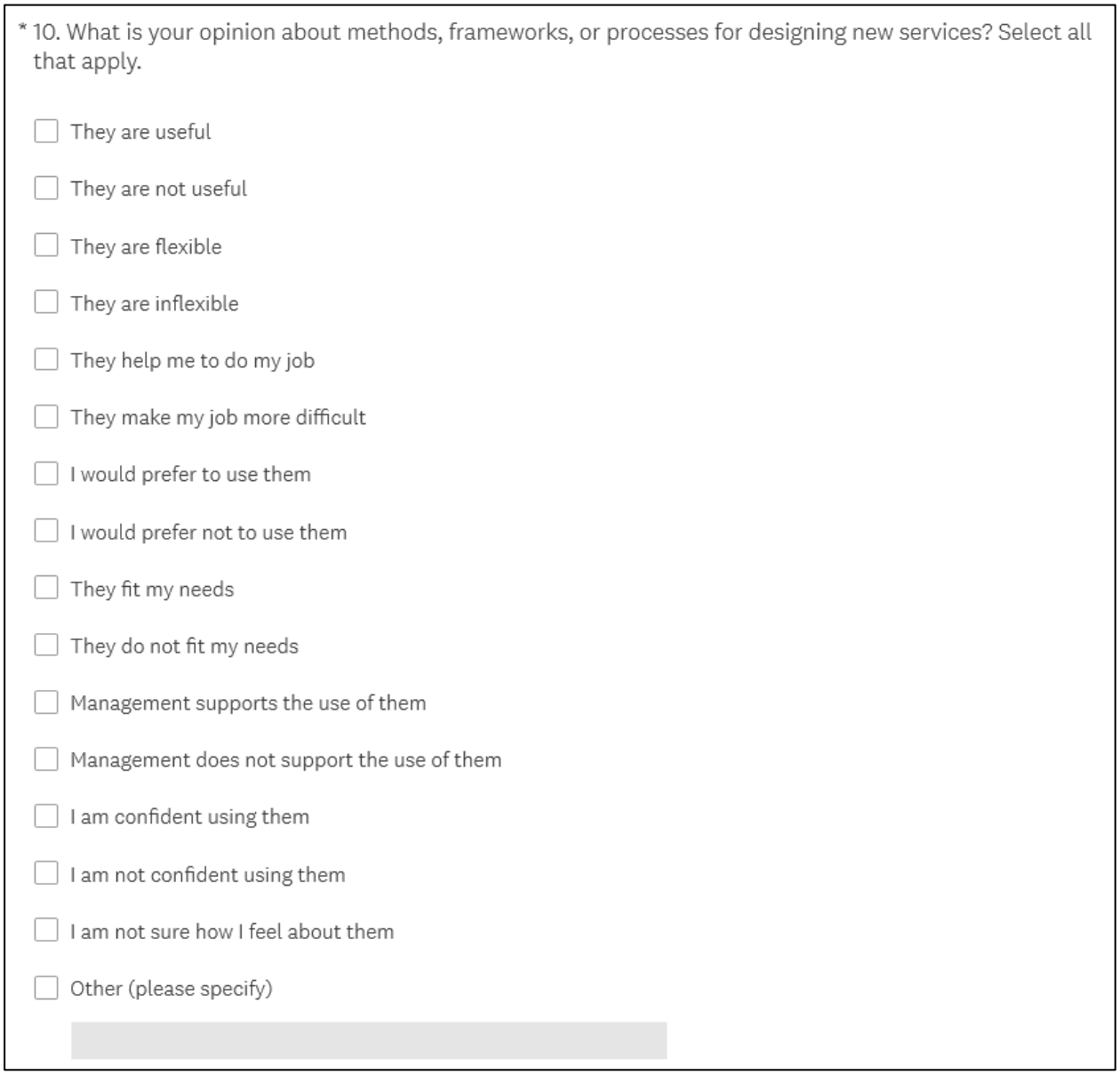


Figure 21. Survey Question 10

Positively worded questions, for example, “They are useful”, generally received significantly more selections than negatively worded questions, for example, “They are not useful”. This can be seen as showing that participants generally feel more positive about the use of methods, frameworks, or processes in their work.

For this question, participants also had the option to write their own statement about their opinions about the use of methods, frameworks, or processes for the design of services. Two of the respondents chose to do this. One responded, “processes lead me, but I need a range where I can work out[side] of the process”. This speaks to flexibility being a valuable trait for methods, frameworks, or processes, but this respondent did not select either “They are flexible” or “They are inflexible”, possibly showing that they had mixed feelings about how to use methods, frameworks, or processes while still keeping the flexibility that they find valuable. Another respondent said that “methods, framework, etc. have to be adopted to the company”, which

echoes the findings from the literature review that companies need to be critical of applying generalizations to the design of services (Jaakkola, et al., 2017).

As seen in Figure 22, more than 84% of respondents said that methods, frameworks, or processes “are useful” for the design of new services, and more than 53% say that they are helpful to their job and that they prefer to use them.

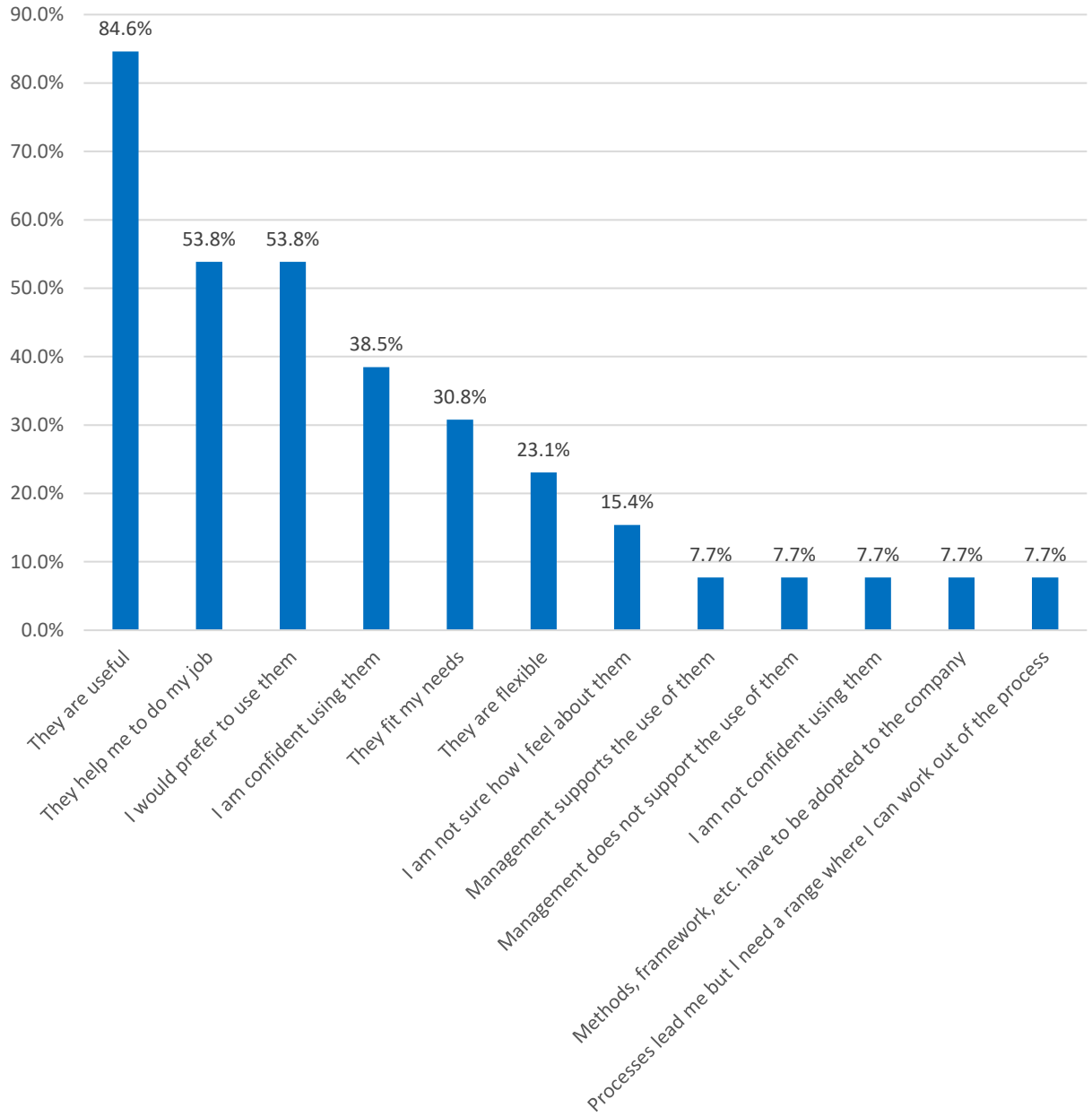


Figure 22. Results of Survey Question 10

Question 11 and 12, as seen in Figure 23, ask if the respondent has received training on the design of services and if so, how useful the training was. This helps to give a background about the respondent and could potentially be an indicator for how the company which they work for values service design by making sure that employees receive training on the subject.

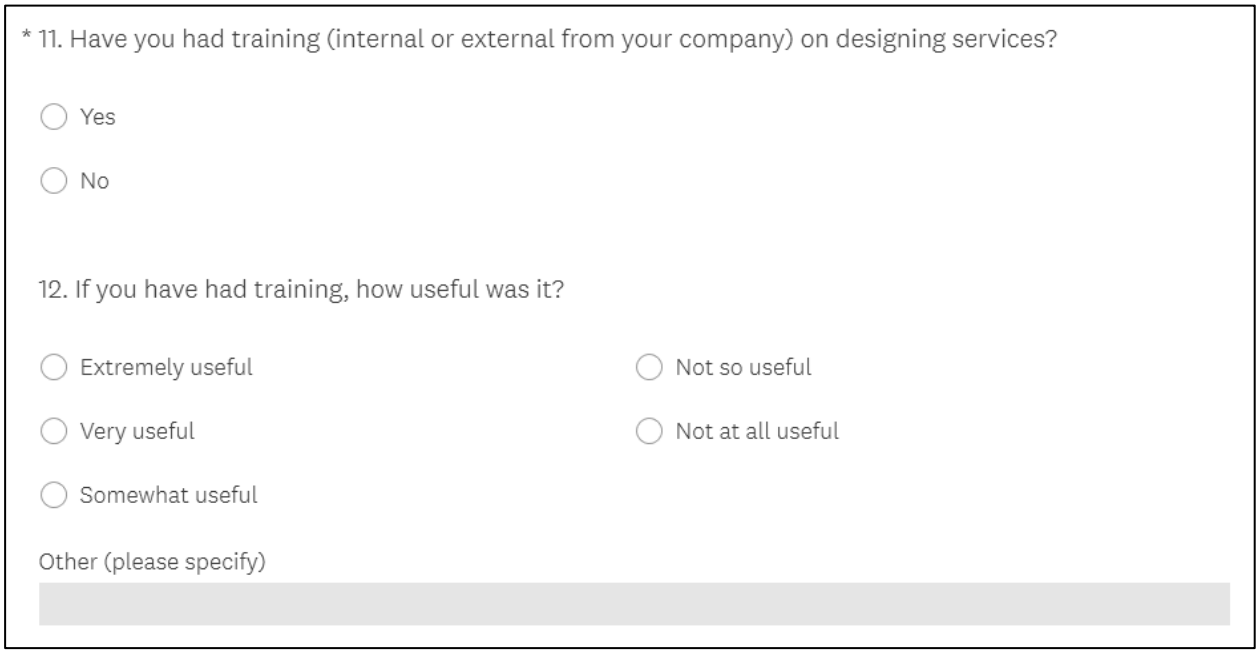


Figure 23. Survey Questions 11 and 12

Eight of the 13 respondents, 61%, have had training on designing services. This is seen in Figure 24.

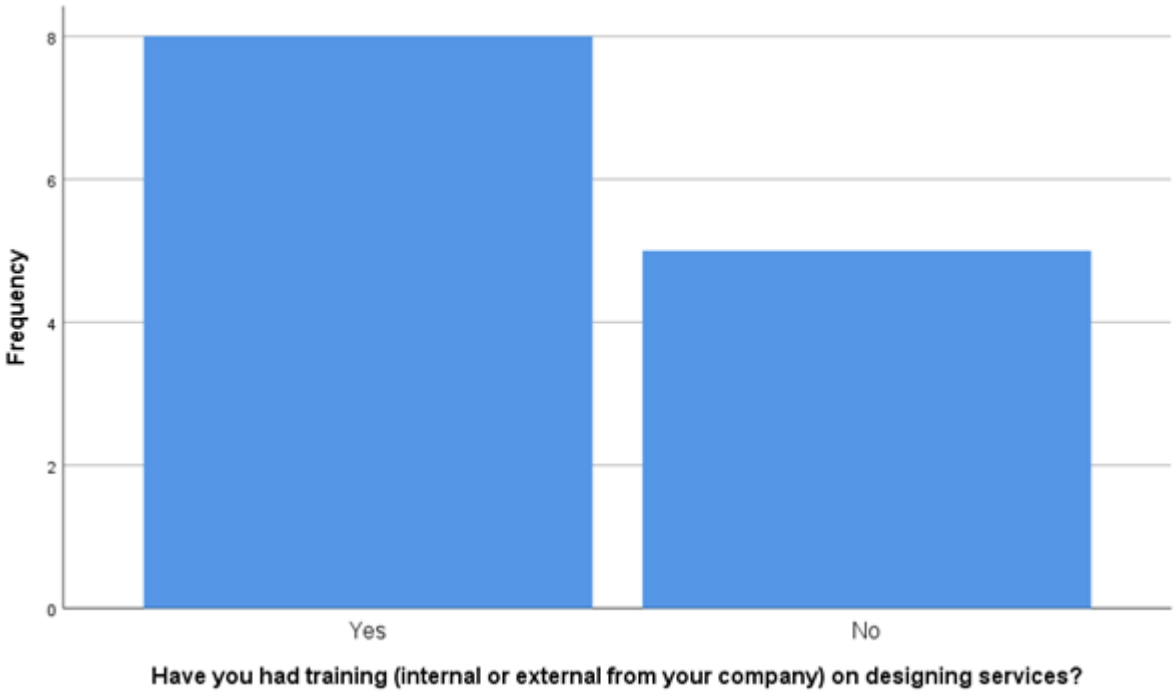


Figure 24. Result of Survey Question 11

Although answering the question about the usefulness of the training was optional, all eight of the respondents who reported that they had received training on designing services responded about how useful they found the training to be. Of those eight, six found the training either “Extremely useful” or “Very useful”. This is seen in Figure 25.

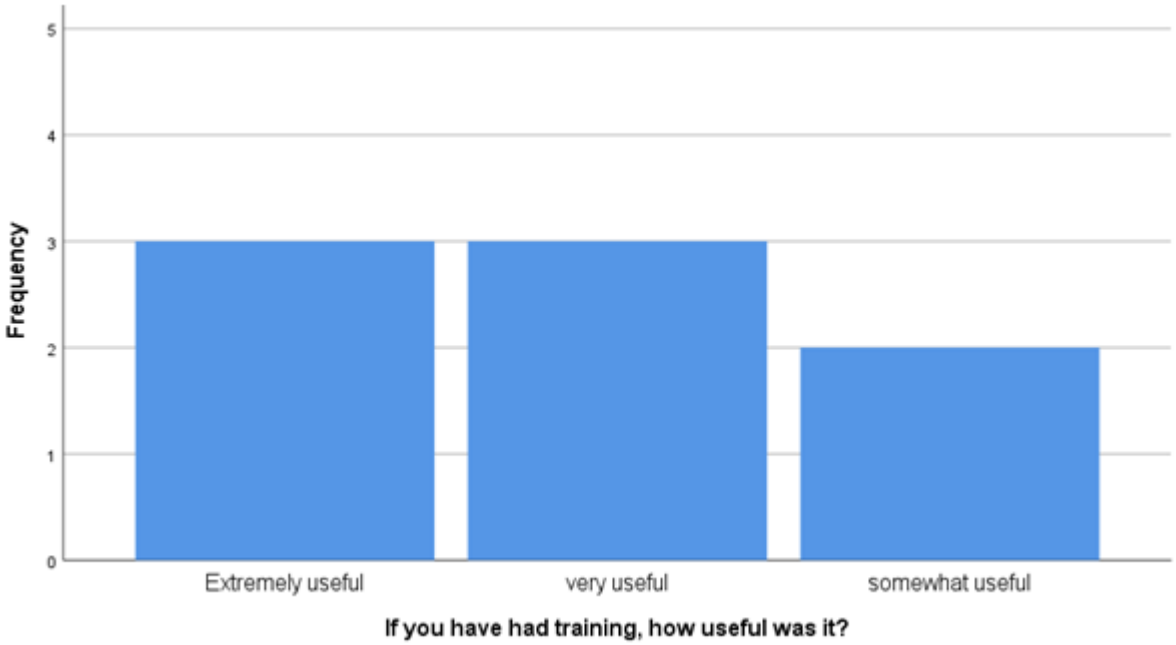


Figure 25. Results of Survey Question 12

As one of the issues brought up in the literature review is the insufficient experience to manage services in manufacturing companies (Uchihira, et al., 2008), it makes sense that training on service design is especially helpful to employees in these companies. Although the information given in the survey is not able to evaluate which kinds of trainings the participants had received and if they were performed internally or externally, it still provides useful information.

Question 13, as seen in Figure 26, aims to find out if participants feel that methods, frameworks, or processes solve, create, or have no effect on challenges in service innovation.

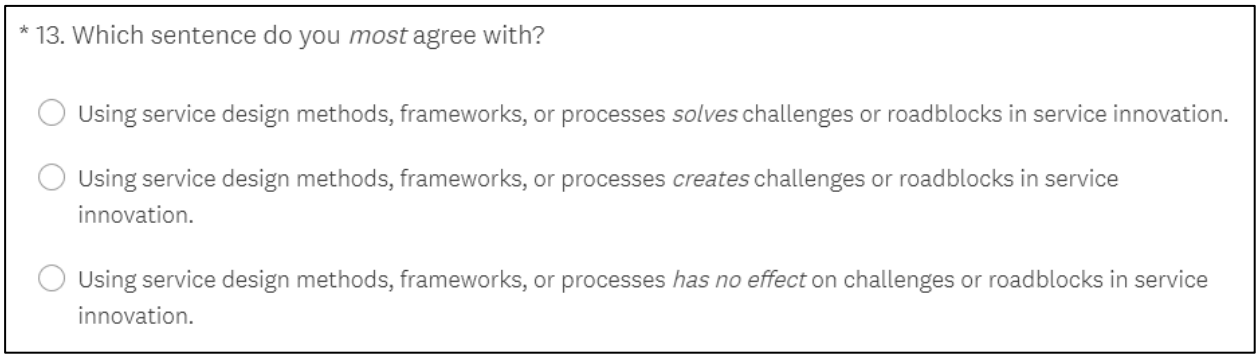


Figure 26. Survey Question 13

This can also be seen as a core question in the survey, as the literature review showed that different authors found conflicting information about the effect of service design methods, frameworks, or processes on the success of manufacturing companies. Therefore, finding the opinions of the participants in this case study would be very useful information. Nine of the 13 respondents, or 69%, as seen in Figure 27, said that they felt that using methods, frameworks, or processes solve challenges in service innovation.

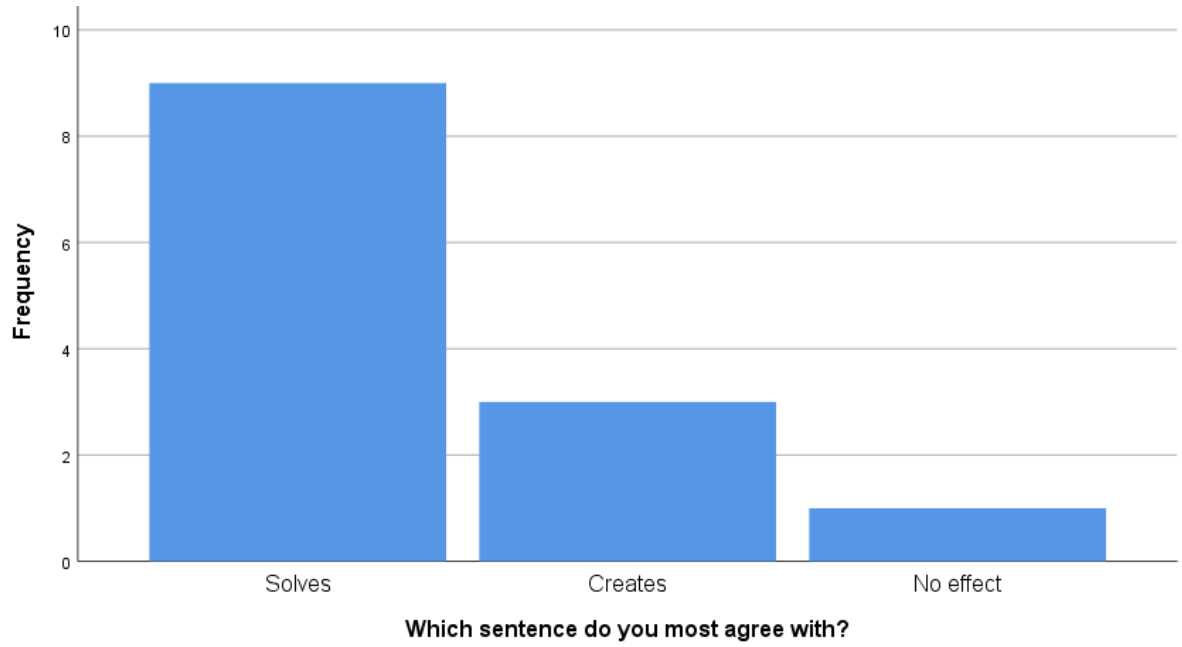


Figure 27. Results of Survey Question 13

Question 14, as seen in Figure 28, asks participants to choose the three biggest challenges that they face in service innovation. This is also a main question in the survey as it related directly to the research question. The options for these answers were specifically drawn from the literature review in order to find out what challenges respondents of this case study consider as having the greatest impact on their job in service innovation.

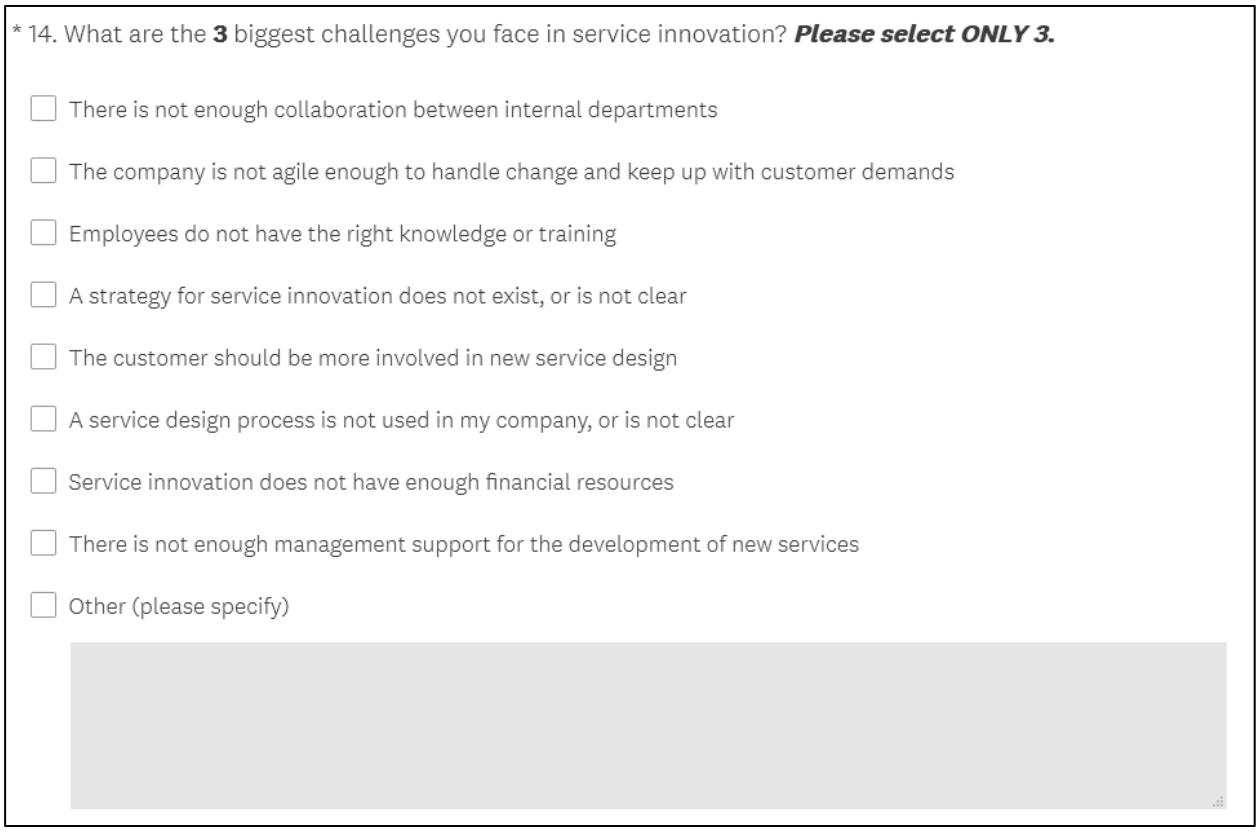


Figure 28. Survey Question 14

As all of the options given in the survey were pulled from the literature as challenges faced by manufacturing companies in the service transition, it can be assumed that most of the options will apply to the participants, but in varying degrees. Therefore, the question was limited to the choice of their top three challenges. This provided a kind of prioritization to the challenges faced. Although the participants were not given an option to rank the chosen challenges, it still provides useful information about what the participants consider to be the most difficult challenges that they face in service innovation.

The top chosen challenges in service innovation, as seen in Figure 29, were “there is not enough collaboration between internal departments”, “employees do not have the right knowledge or training” and “the company is not agile enough to handle change and keep up with customer demands”.

Although Figure 28 shows these three answers also as the top choices in the survey, the survey was set to randomly mix the order of the options so that the participants were not always seeing the same order. This was done to help avoid that participants simply choose the top three options without thoroughly considering them and marking the first three options as the top three chosen challenges.

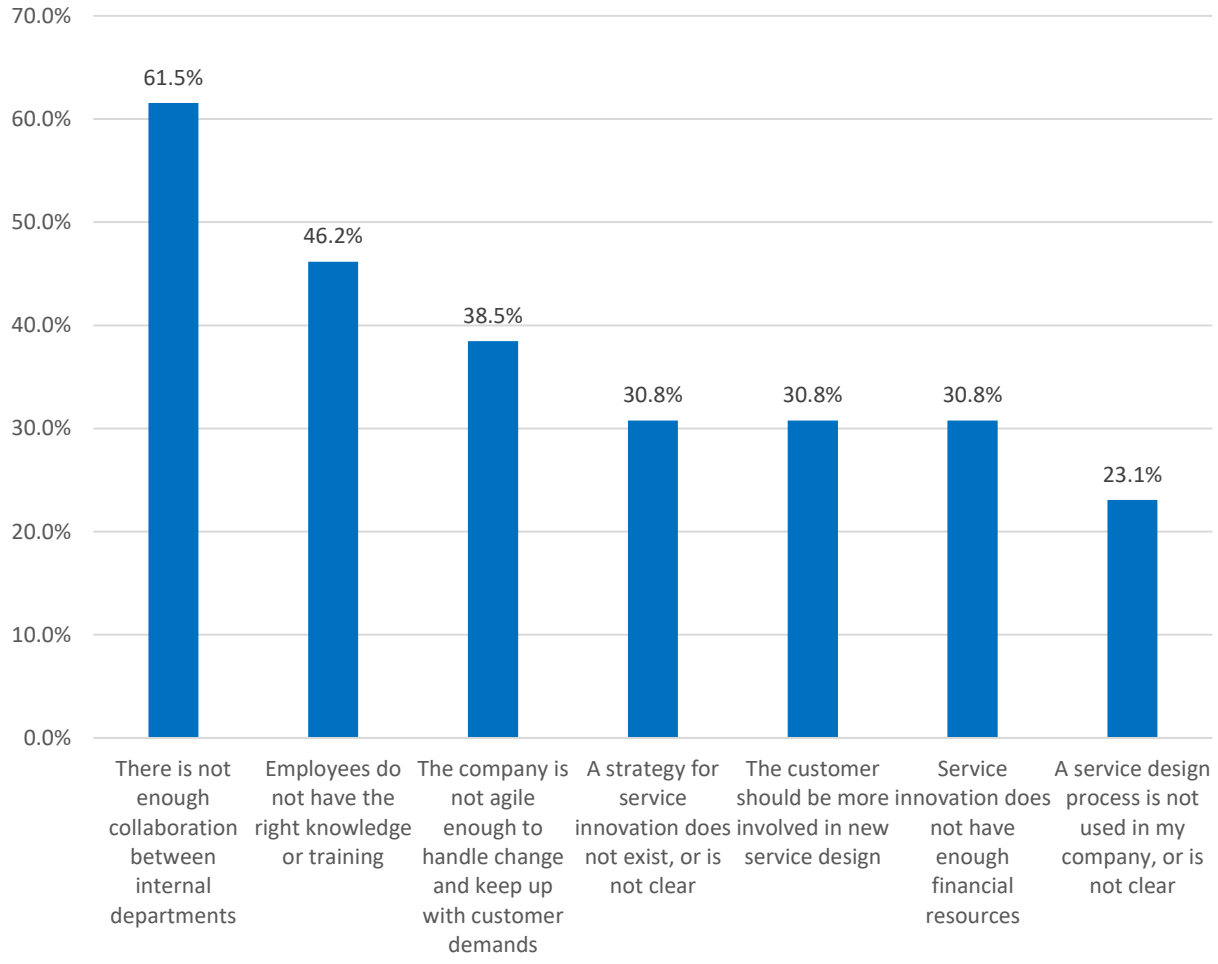


Figure 29. Biggest Challenges in Service Innovation

Questions 15 and 16, as seen in Figure 30, asks the participants if they would like to add any details or additional information about service innovation or the design of services. Both of these questions were optional, however, five of the respondents choose to add additional comments in one or both of these fields.

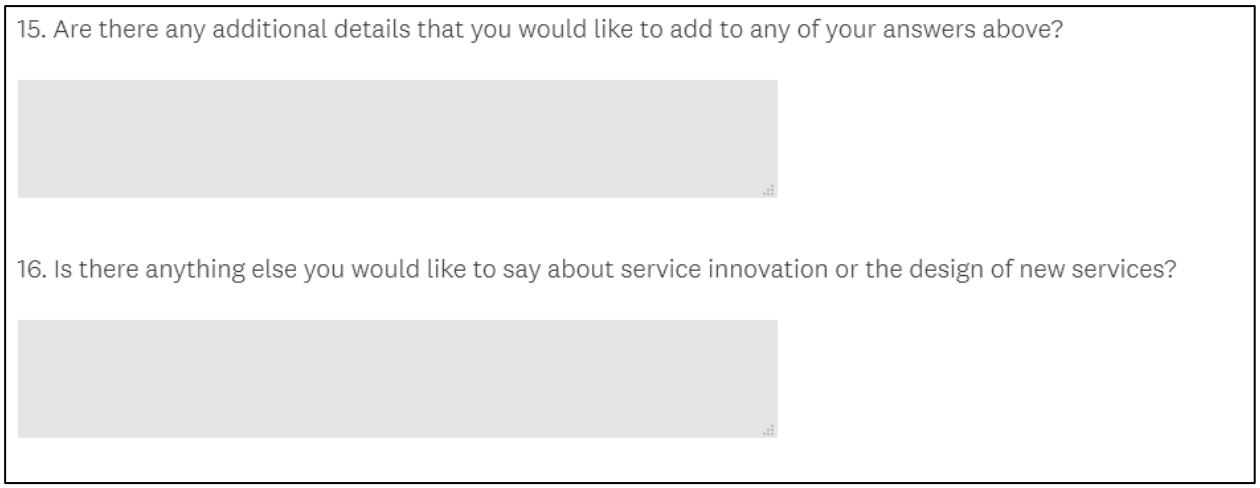


Figure 30. Survey Questions 15 and 16

These comments provided insightful information that will be discussed in more detail in the analysis section of the results.

Finally, Question 17, as seen in Figure 31, simply asks the participants if they would be willing to answer follow up questions. This question is not relevant for the analysis, and no follow ups with participants were seen as necessary as part of this research.

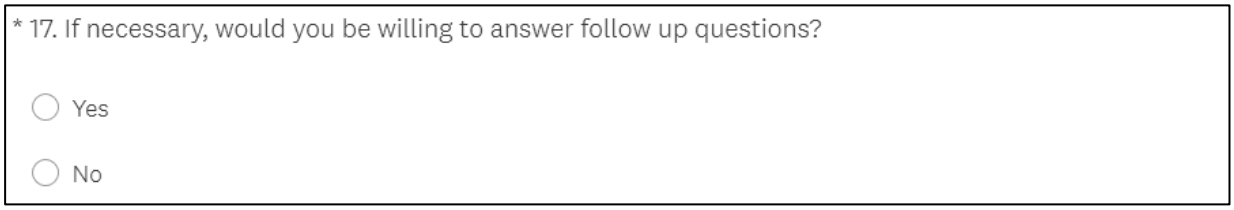


Figure 31. Survey Question 17

4.3 Case Study Analysis and Connections

The results of the survey offered several connections, both to each other and to the literature review, that warrant discussion.

4.3.1 The Impact of the Company Having Documented Methods, Frameworks, or Processes for Designing New Services

As several studies referenced in the literature review found that many companies do not have formal methods, frameworks, or processes for service design, one of the survey's core questions was if the companies represented in the case study do have them. As shown in the previous section, eight of the 13 respondents said that their company had them, equaling 61%.

However, as seen in Figure 32, there can be disagreement among the employees who work for the same company about the existence of methods, frameworks, or processes for service design. In Company 6, one employee says that their company has documented methods, frameworks, or processes for service design, while the other employee does not know if they have them or not. In Company 7, there is also conflicting answers regarding the existence of methods, frameworks, or processes. This can show that either the communication about service design in these two companies is poor, that the design of services is unsystematic, or that their use is not a priority in the company.

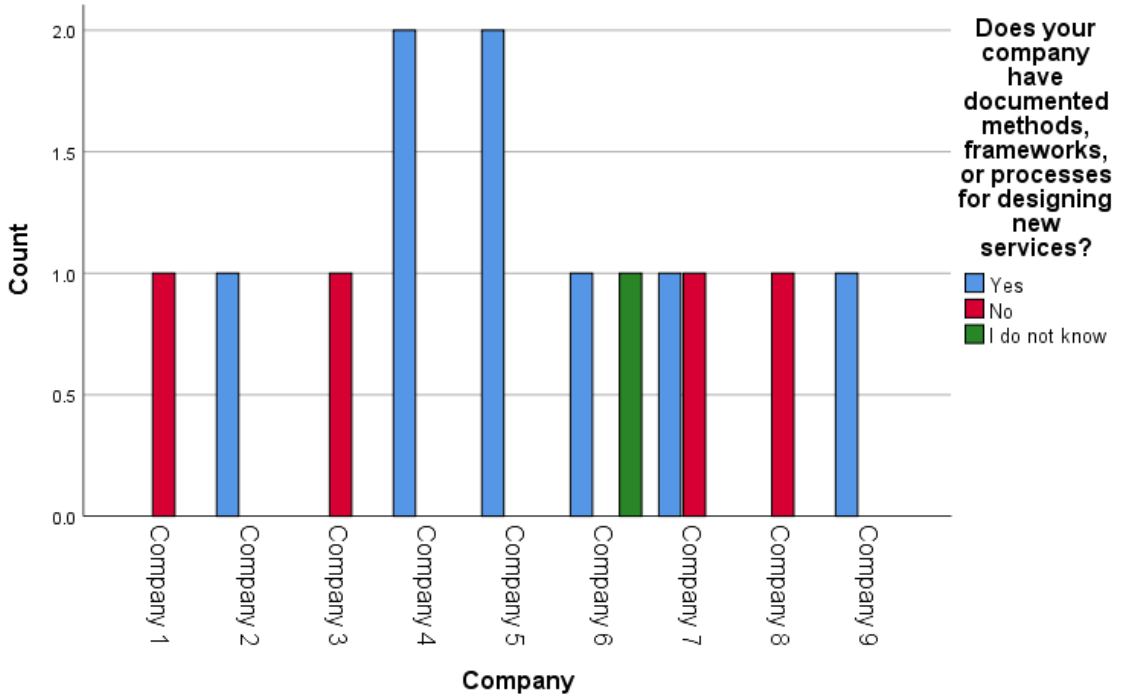


Figure 32. Having documented methods, frameworks, or processes for designing new services, by company

Gremyr et al. (2010) found that companies may have methods, frameworks, or processes for service design, but that they are not consistently or systematically using them. Based on the answers from the survey, the results of this case study can be compared with the findings of the Gremyr et al., study.

First, the frequency which the employees use methods, frameworks, or processes for designing new services can be analyzed. As mentioned previously, the number of respondents who “always” use them was just one out of 13. Six respondents say that they “usually” use them, four say that they “sometimes” use them, and two say that they “rarely” use them.

When comparing the results of this question to the question asking if their company has documented methods, frameworks, or processes, it can be seen that employees who work for companies with documented methods, frameworks, or processes are more likely to use them at a higher frequency. This can be seen in Figure 33.

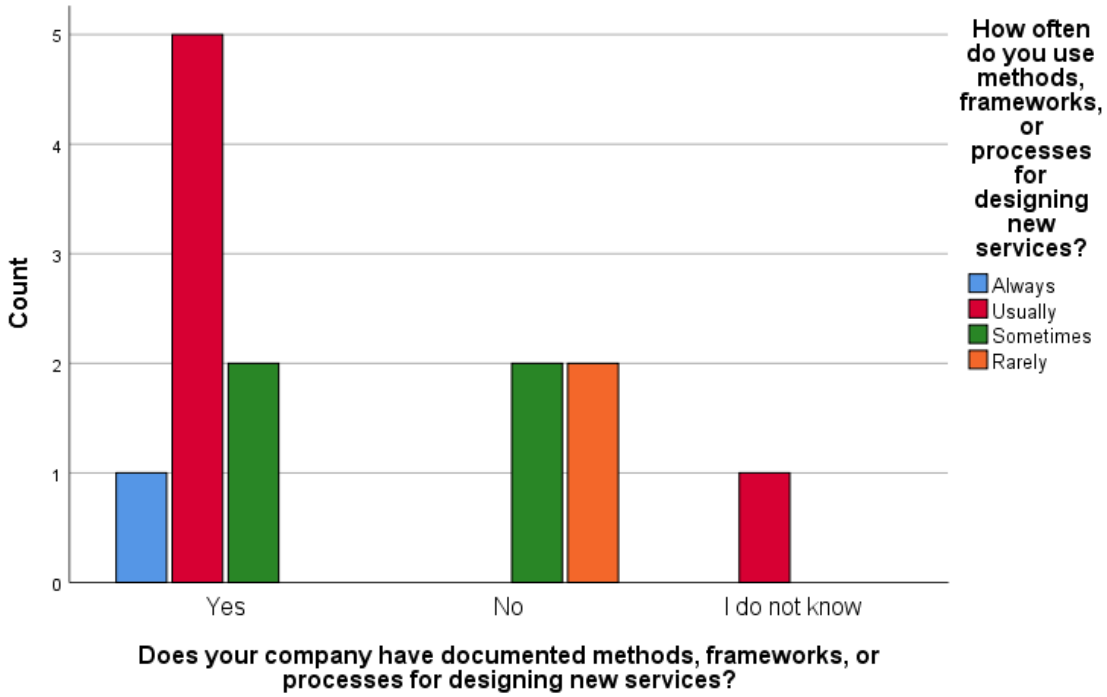


Figure 33. Connecting documented service design methods, frameworks, or processes to frequency of usage

While the case study finds that employees are more likely to use methods, frameworks, or processes at a higher frequency when their company has documented methods, frameworks, or processes in place, they are still unlikely to always use them. This matches what Gremyr et al. (2010) find in their study, and shows that simply having methods, frameworks, or processes in place does not mean that they are being used. While it can be assumed that employees are unlikely to use methods, frameworks, or processes due to their poor fit, which will be discussed more in the next section, it is more difficult to assume that employees who always use them are doing so because they fit very well. They could “always” use them due to a stricter company policy on service design but not necessarily feel that they are very helpful to accomplishing service innovation. However, this relation was not further researched in this case study.

The results of the question about the existence of documented methods, frameworks, or processes in service design can also be compared to the results of the question about how important the participants think their use is for designing new services. If the respondents feel that the use of methods, frameworks, or processes are important, it can be assumed that they are seen as effective in helping with their tasks. This case study shows that if a company has documented methods, frameworks, or processes for the design of services, a higher number of employees are more likely to feel that using them is important for their work in service design compared to employees whose companies do not have them. The results of comparing these two questions is shown in Figure 34.

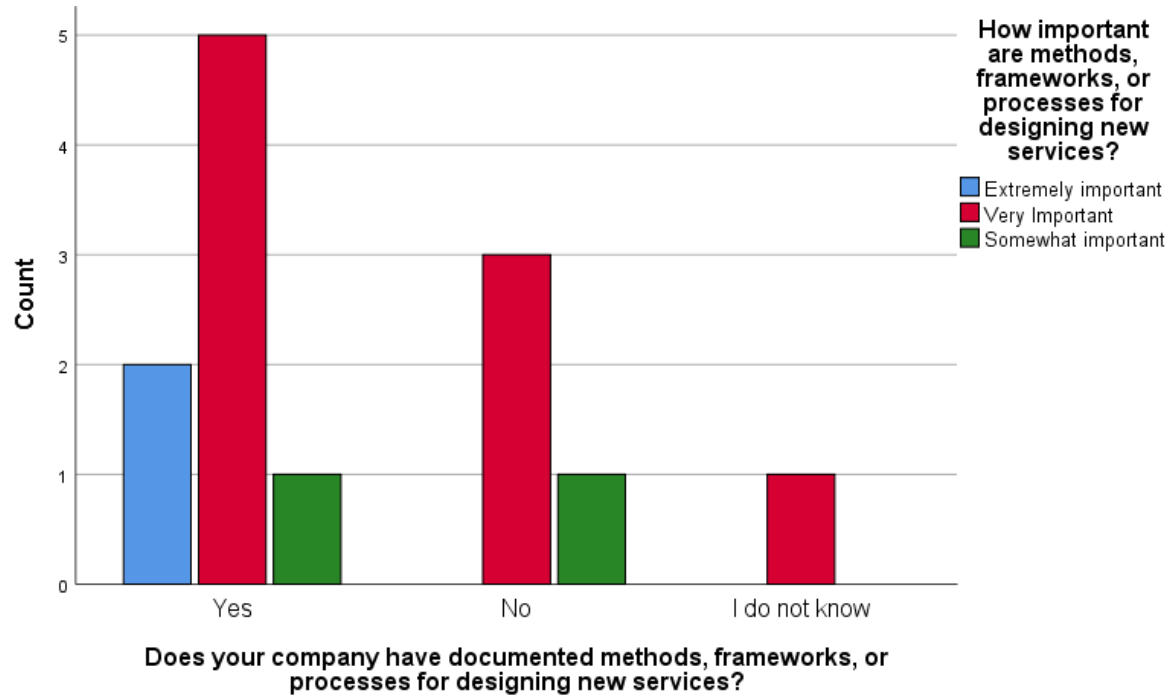


Figure 34. Connecting documented service design methods, frameworks, or processes to importance

The case study finds that when companies have documented methods, frameworks, or processes for designing new services, employees are more likely to use them at a higher frequency and are more likely to think that they are important in the design of new services.

As concluded in the literature review, the use of service design methods, frameworks, or processes is connected to solving the cultural and strategic challenges companies face in the service transition. How important something is can potentially speak to how effective it is, and in this case, it can be concluded that respondents who say that methods, frameworks, or processes are more important are speaking to how effective they are at solving challenges. For the one respondent who said that their company had documented methods, frameworks, or processes for service design but said that they were only somewhat important, may also be saying that they are not helping in solving the challenges they are facing.

4.3.2 The Fit of Methods, Frameworks, or Processes Used in Service Design

One conclusion of the literature review was how some studies found that the methods, frameworks, or processes used were not actually fitting for service design. This can be due to service design methods, frameworks, or processes being poorly adapted from product design (Gremyr, et.al., 2014), that the companies are not adapting their processes based on the types of services they are designing (Zomerdijk & Voss, 2011), or that they are too rigid to be effective in designing services (de Jong & Vermeulen, 2003; Wittel et al., 2016). Additionally, it was concluded that methods, frameworks, or processes can be used to help address cultural and strategic challenges that companies face.

Two of the survey questions can address this topic of fit. The first applicable question is the one asking if the use of methods, frameworks, or processes solves, creates, or has no effect on

challenges in service innovation. This directly relates to the question of fit because, as concluded in the literature review, fitting methods, frameworks, or processes should be able to help solve challenges faced in service innovation. The second question concerning the fit asks how similar or different the company's methods, frameworks, or processes are for service design compared to product design.

Figure 35 shows the comparison between the existence of documented methods, frameworks, or processes for designing new services in the companies, and if the respondent feels that the use of them either solves, creates, or has no effect on the challenges faced in service innovation.

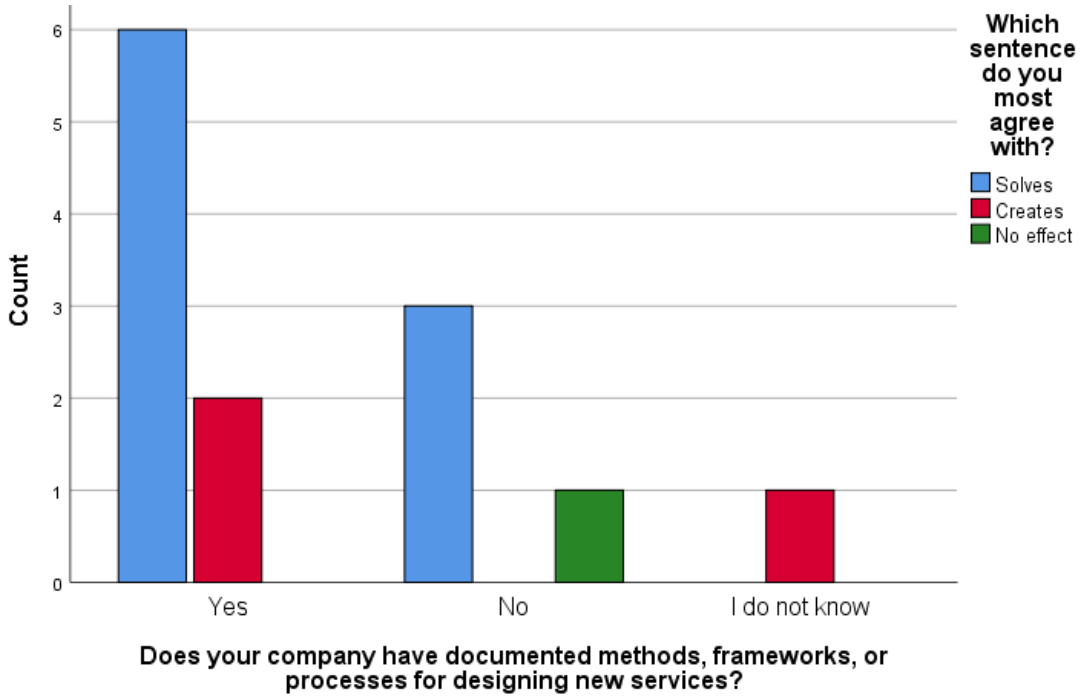


Figure 35. Connecting documented service design methods, frameworks, or processes to effect on challenges

From this comparison, it can be assumed that the two respondents of the case study who said that their companies had documented methods, frameworks, or processes for designing new services but also answered that they create challenges in service innovation are using methods, frameworks, or processes that are not fitting to their needs.

However, one of the respondents actually added an additional comment to explain this answer, saying "Service Innovation, if not implemented from the start of a company, is always seen as a roadblock or [as] hindering the growth of service or business, but after implementing the right strategy, it will do the exact opposite." So, this participant is not actually saying that the documented methods, frameworks, or processes of the company are poorly fitting, but is commenting on how difficult their successful implementation into a company can be. This sentiment centers around the difficulty of change, which was echoed with other participants as well, and will be discussed in more detail in section 4.3.4.

As established, the question regarding if methods, frameworks, or processes in service design creates, solves, or has no effect on challenges in service innovation is an indicator of if they address underlying issues, which is a measurement of fit. Therefore, the results of this question

will be compared to the results of the question regarding how similar or different the methods, frameworks, or processes are for service design and product design. This will show any possible connection of service design methods, frameworks, or processes not fitting specifically due to being poorly adapted from product design methods, frameworks, or processes.

None of the respondents reported that the service and product design methods, frameworks, or processes were “completely the same”, but three of the 13 said they were “more similar than different”. The remaining 10 said that they were either “more different than similar” or “completely different”.

As seen in Figure 36, all four respondents who said that the service and product methods, frameworks, or processes were “completely different” also said that they thought that the use of them solve challenges in service innovation.

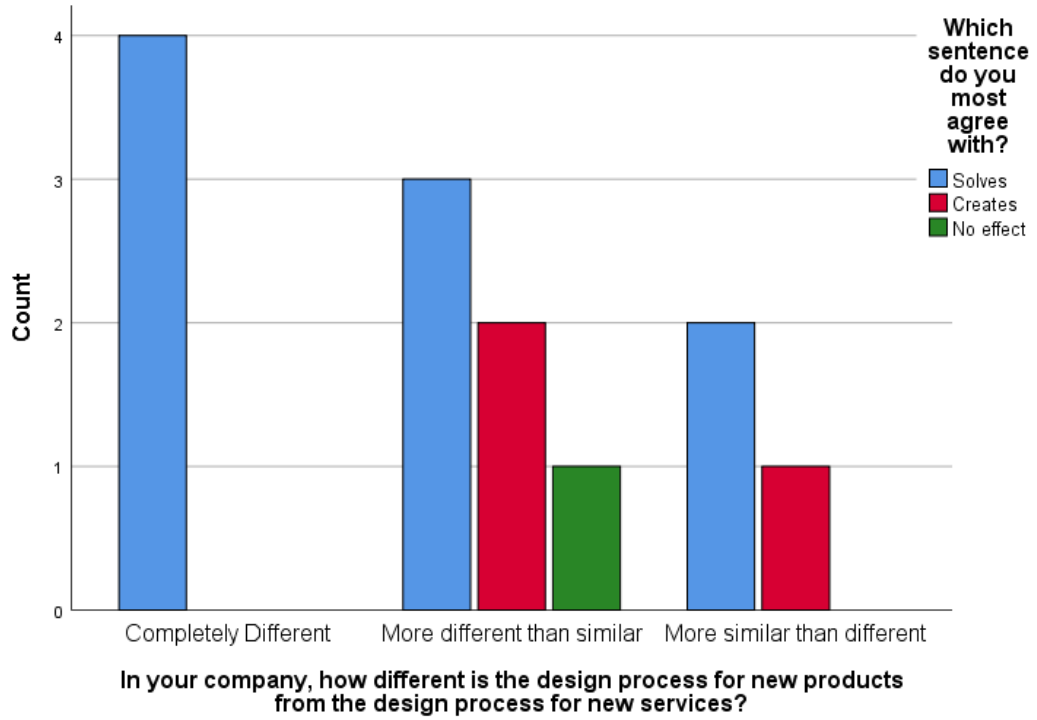


Figure 36. Difference or similarity of methods, frameworks, or processes for product and service design to effect on challenges

However, the respondents who said that product and service design methods, frameworks, or processes were “more different than similar” or “more similar than different” were relatively split in their opinions of if the use of them solve or create challenges in service innovation, although they were slightly tending to report that they solve challenges.

This shows that in this case study, employees who work for companies that use “completely different” methods, frameworks, or processes for service design than for product design are more likely to say that the use of them solve challenges in service innovation than employees who work for companies with more closely related methods, frameworks, or processes, but that more closely related service and product design methods, frameworks, or processes are also capable of solving challenges in service innovation.

Lastly, the topic of fit due to similarity or difference of product and service design methods, frameworks, or processes can also be looked at by comparing the results of this question to the results of the question about how often the respondents uses them. These results can be seen in Figure 37.

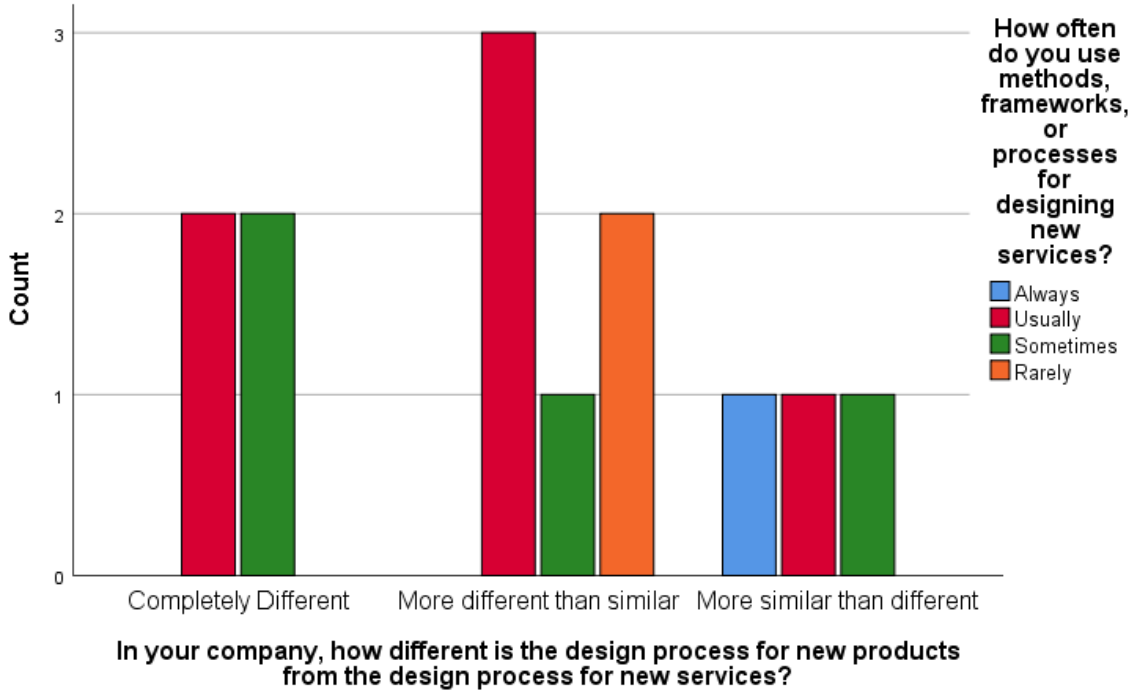


Figure 37. Difference or similarity of methods, frameworks, or processes for product and service design to frequency of use

The one respondent who said that they always use methods, frameworks, or processes for the design of services responded that the product and service design methods, frameworks, or processes were “more similar than different”, and the rest of the respondents answers are spread out in no noticeable pattern.

Therefore, there is no clear connection found in this case study between the difference or similarity of the methods, frameworks, or processes for service design and product design when compared to their frequency of usage, and only a slight connection to if they think that the use of methods, frameworks, or processes for the design of services solves, creates, or has no effect on challenges in service innovation. In this case, fitting methods, frameworks, or processes can be similar to the ones used for product design, and therefore the rating of how effective they are at solving the challenges faced in service innovation is likely based on other factors.

4.3.3 The Three Biggest Challenges in Service Innovation

One of the core questions in the case study dealt with the biggest challenges faced by employees involved in the design of services. As previously stated, these options were chosen based on the findings of several studies cited in the literature review. The top answers that respondents gave to this question were: “there is not enough collaboration between internal departments”, “employees do not have the right knowledge or training” and “the company is not agile enough to

handle change and keep up with customer demands". "There is not enough collaboration between internal departments" came in at the top of the list with over 61% of the participants choosing this option as one of the top three challenges they face in service innovation.

In section 3.2.1 of the literature review, it was discussed how the challenges faced by manufacturing companies in the design of services could be broken down into structural, cultural, and strategic challenges, but that only cultural and strategic challenges were applicable when talking about challenges which can be addressed by the use of methods, frameworks, or processes in the design of new services.

The options of top challenges in service innovation which are listed in the survey can also be categorized by cultural challenges, strategic challenges, or a mix of cultural and strategic challenges. As can be seen in Figure 38, of the eight provided options, three can be seen as cultural challenges, three can be seen as strategic challenges, and two can be seen as mixed challenges.

Options for Top 3 Biggest Challenges	Type of Challenge
There is not enough management support for the development of new services	Cultural
A service design process is not used in my company, or is not clear	Strategic
A strategy for service innovation does not exist, or is not clear	Strategic
The customer should be more involved in new service design	Strategic
Service innovation does not have enough financial resources	Mixed
The company is not agile enough to handle change and keep up with customer demands	Cultural
Employees do not have the right knowledge or training	Mixed
There is not enough collaboration between internal departments	Cultural

Figure 38. Types of challenges for the biggest challenges (own presentation)

Of the top three challenges chosen by the case study participants, two are cultural challenges, and one is a mixed challenge. This indicates that the participants struggle more with cultural challenges in service innovation than they do with strategic ones.

In their study, Bettercourt and Brown (2013) make the connection between strategy and culture, concluding that the company culture is what drives the success or failure of a company strategy and therefore is a more important factor for success, noting that "for most organizations, strategies succeed or flounder based upon their congruence with company culture. And, the present culture of most product companies is not conducive to service innovation" (p. 281). The findings of this

case study match what Bettercourt and Brown found, showing that cultural challenges impact employees to a greater degree than strategic challenges do.

Other studies cited in the literature review also find that the culture in manufacturing companies makes it difficult to be successful in the service business. Kindström and Kowalkowski (2009) call the tensions between a service and manufacturing culture a “constant challenge” (p. 157), and Nuutinen and Lappalainen (2012) note that “the importance of an organisational or corporate culture in service business transformation in manufacturing companies has been noticed by several writers” (p. 138).

Therefore, it is not a surprise that cultural challenges were more likely to be chosen as one of the top three challenges employees face in service innovation.

In the following sections, the top three challenges found in the case study will be talked about more in depth. Additionally, as the basis for this paper is the use methods, frameworks, or processes in service design, the results for this will be talked about in section 4.3.6.

4.3.3.1 There is not enough collaboration between internal departments

Over 61% of respondents said that not having enough collaboration between internal departments was one of their top three challenges faced in service innovation, making it the most commonly chosen answer.

Kindström and Kowalkowski (2009) find that the poor performance of a service is “due to delivery problems such as uneven quality, poor delivery processes as well as internal miscommunication, primarily between sales and the service delivery functions” (p. 161). This also points to how important internal collaboration can be for a company. Pereira, Rocha, Nunes, Borchardt and Viegas (2018) go one step further, finding in their study that “the lack of interdepartmental processes affects the quality of the services offered” (p. 223). They relate this lack of collaboration to the lack of knowledge of service employees, which will be discussed more in the next section, by saying that “the isolation of the service professionals from the rest of the organization seems to prevent the dissemination of knowledge among the departments, thus reducing the manufacturer’s innovativeness” (p. 223).

Connecting these results back to the use of methods, frameworks, or processes in service design, it has been shown that applying a framework can be a way to increase interaction between product and service departments. Gebauer, Krempl, Fleisch, & Friedli (2008) say that “the interaction between product and service innovation may be and should be part of the new service development framework in manufacturing companies” (p.400). It cannot be confirmed or disputed with the information collected in this case study if the use of methods, frameworks, or processes in service design actually increases internal collaboration, but this could be an area for future research.

4.3.3.2 Employees do not have the right knowledge or training

46% of respondents said that employees not having the right knowledge or training was one of their top three challenges in service innovation, making it the second most chosen answer. The fact that employees do not have the right knowledge or training for service innovation can be due to cultural challenges (for example, a lack of priority for services in the company), strategic challenges (for example, a poor training plan), or some mixture of the two.

As mentioned above, Pereira et al. (2018) blame the lack of knowledge of service employees on the absence of close interdepartmental contact, while others blame it simply on insufficient experience. Uchihira et al. (2008), for example, list this problem as one of the three major organizational difficulties faced by manufacturing companies breaking into the service business, saying “most of manufacturing companies have insufficient experience to manage service businesses. Poor understanding leads people to unproductive discussion and poor decision making” (p. 1550). One respondent in the case study made the comment that “most of the companies are focused on machine/plant production… [and] Service Innovation is a new task for traditional service departments”, which touches on both cultural and strategic topics related to inexperience.

4.3.3.3 The company is not agile enough to handle change and keep up with customer demands

Over 38% of respondents said that the company not being agile enough to handle change and keep up with customer demands was one of their top three challenges in service innovation, making it the third most chosen answer. While the core of this question is around the internal change needed to stay agile, it is important to point out that external change is also addressed by implying that customer demands are changing. However, the center of the question is focused on the internal changes that manufacturing companies encounter when having to meet those external customer demands (such as adding services to their sales portfolios) and is not actually addressing external changes such as changing markets. So, while being able to adjust the company’s strategy based on current market demands is obviously a strategic challenge that manufacturing companies face, there is always a cultural element that needs to take place in order to meet those strategic challenges when internal adjustments in thinking or processes are required. Therefore, this question is seen as relating to cultural challenges faced within the company.

The challenges respondents face that are directly related to change will be discussed more in detail in section 4.3.4

4.3.3.4 Conclusion of the Three Biggest Challenges in Service Innovation

Based on the data from the case study, employees in manufacturing companies are facing more cultural than strategic challenges, with a lack of collaboration between internal departments being the top chosen challenge in service innovation.

4.3.4 The Challenges of Change

Each company which transitions from selling only products to adding services to their sales portfolio has to endure the change that comes along with this, and the employees of these companies are on the front lines of this transformation.

Of the five respondents who choose to write additional comments about service innovation or the design of new services in the survey, four of them specifically made comments about the challenges they face in their companies when it comes to change. Being able to handle change is seen as a cultural topic, which fits into the previously discussed issue around cultural challenges facing manufacturing companies in service innovation.

One participant said “most involved employees are used to think[ing] in [terms of] products and don’t understand that [the] service offering has to be treated like a product including life cycle management. Bringing this into [the] mindset of people is a change management issue”. This comment matches with the findings of the literature review that employees in manufacturing companies struggle with designing services due to a product mindset (Uchihira, et al., 2008), but at the same time, it points out that services need proper care and to be thoughtfully designed in the same way that products are.

Another respondent mentions the difficultly handing the change in business model that takes place when manufacturing companies start selling services by saying “large compan[ies] in Europe will have a hard time because [of] the shift from producing and selling [products], to [selling] product[s] as a platform for services”. This directly relates to the service transition as discussed by Gebauer, Fleisch, et al. (2005) and as illustrated by Ebeling et al. (2014), as seen in Figure 39.

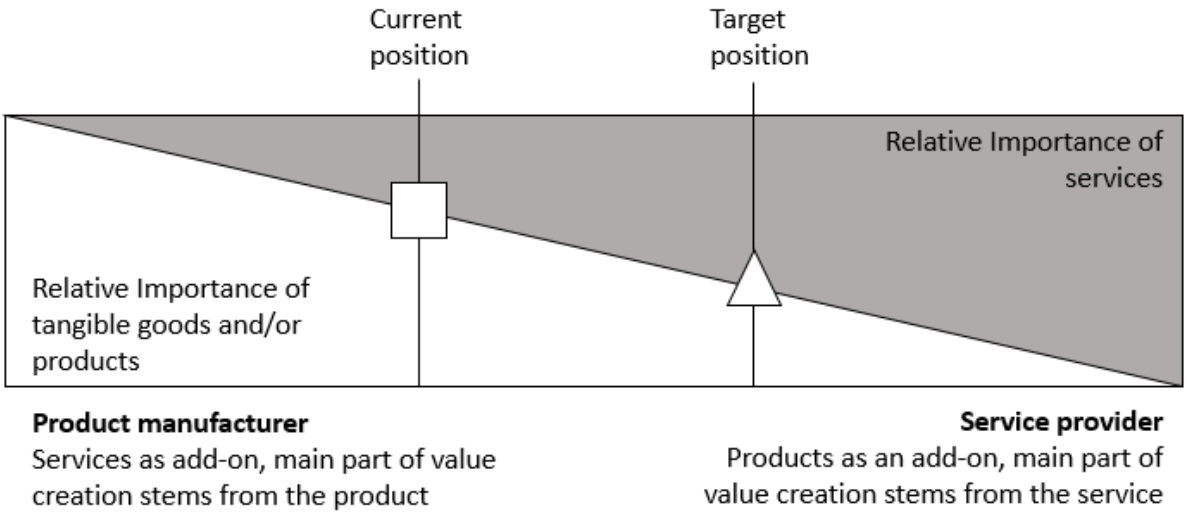


Figure 39. Product-service continuum (Ebeling et al., 2014, p.231, adapted from Olivia & Kallenberg, 2003, p. 162)

This transition has to be embraced, at least to a certain degree, in order to be successful, both on an organizational level as discussed by Gebauer, Fleisch, et al. (2005), or on an individual service-by-service basis, as discussed by Stuart (1998). Stuart talks about the failure of a service being an issue of not handling change well by saying “we believe that many of these [services] fail to be considered due to organizational culture and internal resistance to change” (p. 470).

Therefore, management should be aware of this difficultly in handling change and develop a fitting strategy in order to better support the transition phase into services.

4.3.5 The Methods of Service Design

As previously stated, the goal of the case study was not to find out what methods, frameworks, or processes were actually being used by employees of manufacturing companies, however, the answers to this question provided some very useful insight when compared to the literature review findings. A word cloud of the mentioned methods, frameworks, or processes can be seen in Figure 40.

Figure 40. Word Cloud for named methods, frameworks or processes (own presentation)

Answers that were named more than once were design thinking, business model canvas, service blueprint, brainstorming, journey mapping, and SWOT analysis. These are commonly used tools in service design, all of which were mentioned in the literature review as applicable tools by various authors. It should be noted that most of the frequently mentioned methods, frameworks, or processes in this question align with tools that are included as being applicable to the "development and testing" phase of the generic three-step framework introduced in section 3.4.

It is also interesting to note that two of the respondents mention methods, frameworks, or processes in a way that can be interpreted as a stage-gate type roadmap for service design, while the remaining respondents talk about them in a manner that can be interpreted as individual tools that are used for the design of services, but outside of step-by-step, formal process. This differentiation between stage-gate type frameworks for service design and more flexible methods, frameworks, or processes could be an area for future research.

4.3.6 The Challenges of Unclear or Non-existent Service Design Methods, Frameworks, or Processes

Returning back to the top challenges faced in service innovation, the selection of "a service design process is not used in my company, or is not clear" will be analyzed more in depth, even if it was not chosen as one of the top three challenges faced in service innovation by the respondents.

23% of respondents said that one of their top three challenges in service innovation was that a service design process was not used in their company, or that it was not clear, making it the seventh most chosen answer with three of the 13 respondents choosing it. Of the three respondents who reported that unclear or non-existent methods, frameworks, or processes for service design was one of their top three challenges, one of these reported that their company has documented methods, frameworks, or processes for designing new services, and two of them said they did not. This can be seen in Figure 41.

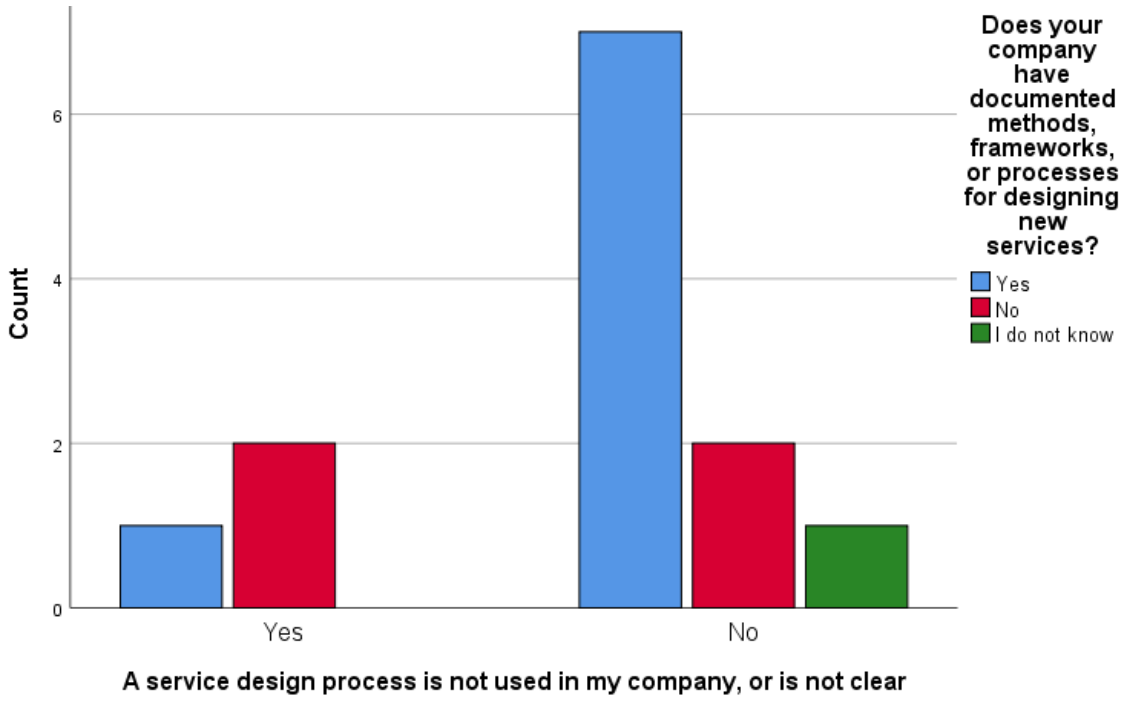


Figure 41. Documented methods, frameworks, or processes and missing or unclear service design process as top challenge

The one respondent who said that their company has documented methods, frameworks, or processes for designing new services but that they are unused or unclear, added a comment in the section asking which methods, frameworks, or processes they used in the design of new services, saying "[we have] partly process and job cards you have to follow… but we have no overall concept… [and] it's not easy to find all available documents and information". Obviously, the methods, frameworks, or processes for service design are not clear in this company and the communication about them is poor. This would be an area that management could make improvements in.

As also seen in Figure 41, of the four respondents who say that their company does not have documented methods, frameworks, or processes for designing new services, two of them feel that the lack of service design processes is a top challenge for them, while the other two do not.

The case study data finds that the absence of or lack of clarity in service design methods, frameworks, or processes is not one of the top challenges for a majority of the participants, regardless of whether or not their company has documented methods, frameworks, or processes for service design.

4.4 SUMMARY OF CASE STUDY

The findings of the case study provide several pieces of useful information.

First, the findings agree with what Gremyr et al., (2010) found in their study, showing that simply having methods, frameworks, or processes in place does not mean that they are being consistently used. The findings of this case study show that regardless of if the company has documented methods, frameworks, or processes for service design or not, they are most likely to be “usually” or “sometimes” used, but very rarely are they “always” used.

The employees who work for companies that have documented methods, frameworks, or processes for service design in place are more likely to think that the use of them helps to solve challenges in service innovation. Additionally, employees whose companies have “completely” different methods, frameworks, or processes for service design as compared to product design all say that that the use of them helps to solve challenges in service innovation, but employees whose companies have either “more similar than different” or “more different than similar” are spilt in their opinion of if methods, frameworks, or processes solve or create challenges in service innovation.

Furthermore, the difficulties of handling the change that comes along with manufacturing companies transitioning from being a product manufacturer to a service provider is an important topic for employees involved in the design of services.

Lastly, the number one chosen challenge employees face in service innovation is the lack of collaboration between internal departments, and more generally speaking, employees are struggling more with cultural challenges in service innovation than they are with strategic ones.

5 DISCUSSION AND CONCLUSION

In conclusion, an overview of the literature review and case study will be discussed, including limitations and suggestions for future research.

5.1 LITERATURE REVIEW DISCUSSION

The companies transitioning from product manufacturers to service providers face a number of structural, cultural, and strategic challenges during this process (and possibly beyond), and the use of formal service design processes is often listed as a success factor for these companies. Several specific benefits are found in the literature when methods, frameworks, or processes are used for service design, yet companies are not likely to have them in place, and even if they do, some studies show that it doesn't mean that employees are using them (Gremyr et al., 2010).

Several service design frameworks have been cited in the literature review, and the analysis of these shows that service design frameworks can generally be broken down into three stages; pre-analysis, development and testing, and implementation, sales and management. These different stages have their own benefits for the design of services which can be connected back to the cultural and strategic challenges that manufacturing companies face in the service transition. Instead of being looked at as one of the success factors for companies moving into the service market, the use of methods, frameworks, or processes in service design can instead be seen as a way to address the specific challenges companies are facing during this transition and should be customized to the companies in order to address their specific needs and struggles.

5.2 CASE STUDY DISCUSSION

The results from 13 valid survey responses were analyzed for the case study, with the employees representing nine different manufacturing companies with a presence in the Styrian market. While a majority of the employees in the case study said that their company had documented methods, frameworks, or processes for service design in place and that their use is "very important", it is very unlikely that they always use them. It is theorized, based on the literature review and the case study, that the employees are less likely to consistently use methods, frameworks, or processes due to the lack of their fit. However, contrary to some of the studies in the literature review found, this does not seem to be due to how closely related the product design and service design methods, frameworks, or processes are but is instead due to other, unknown factors.

The lack of collaboration between internal departments represents the top struggle in service innovation, and cultural challenges are seen as being more of a struggle than strategic ones. Also, the difficulties handling change was mentioned several times in the survey responses and additionally named as one of the top three challenges faced in service innovation.

5.3 CONCLUSION

The goal of this work was to identify how employees involved in the design of services in manufacturing companies with a presence in the Styrian market interact with and perceive methods, frameworks, or processes for service design, and how this relates to their struggles with service innovation. The completed literature review and case study did provide some insightful information into this topic.

It was found that employees in the case study have an overall positive view of the use of methods, frameworks, or processes for the design of services. A large majority view them as “very important” in service design, they overwhelmingly gave positively worded opinions of them as compared to negatively worded statements, with more than 84% of the respondents saying that “they are useful”, and a majority say that methods, frameworks, or processes solve challenges in service innovation.

As for what challenges employees of manufacturing companies are facing in service innovation, only a small number of the participants list not having or having unclear service design processes as being a top challenge they face. Instead, challenges which can be associated with company culture are more likely to be chosen as the top challenges encountered, such as not enough collaboration between internal departments and the company not being agile enough to handle change, as well as to keep up with customer demands.

Additionally, it was discovered that it is common for employees to struggle with issues directly associated with change as a part of the transition from a product manufacturer to a service provider.

Although it is theorized in the conclusion of the literature review that the use of methods, frameworks, or processes in service design can be specifically developed to address the cultural and strategic challenges companies are facing, there is no way to conclude if this is true with the undertaken case study, as neither the specific methods, frameworks, or processes being used in service design nor the degree of success companies are experiencing was a main topic or goal of the study.

5.4 LIMITATIONS

The online survey format used in the case study had some downsides. There was no way to track how many participants clicked on the survey link but did not complete it, or how many tried completing it but were unsuccessful navigating to the “Done” button and therefore their results were lost. One participant was unsuccessful in submitting the survey after multiple tries and their responses were never counted. In order to try and avoid this happening again, a note was added after the survey was already live telling participants to click “done” at the end and mentioning that they should come to a “thank you” page, however, it is not possible to say if this had any positive effect. For future case studies using an online survey platform, a method of tracking the amount of survey link clicks, and a feature to save and view “unfinished” responses would be very useful and provide additional data.

It should also be noted that one respondent noted that “[a] definition of methods, frameworks and processes is missing in the introduction.” This, as well as the usefulness of the written comments to add additional depth from the participants, shows that verbal interviews with a narrower goal would likely lead to additional complexity of information that was not possible in this study.

It is important to point out that this is a small sample size of just 13 respondents from 9 companies, most of whom are headquartered in Styria, Austria. The results from this case study should not be broadly applied to all populations, and is realistically just a starting point for additional research into this and related topics around how employees involved in the design of services in manufacturing companies interact with and perceive methods, frameworks, or processes for service design, as well as how this relates to their struggles with service innovation.

As discussed in the literature review, the borders of the service transition are unclear, and it is difficult to know when companies are out of this transition phase or if it is even possible for manufacturing companies to ever leave the service transition phase. Additionally, if this phase can be left, it is unknown if factors which applied in the service transition phase also apply outside of that phase. It is also unknown where the companies whose employees participated in the survey fall on the transition line, or if they are already outside of the service transition phase altogether.

Lastly, as the survey was conducted in English with participants who are assumed to be non-native English speakers, the likelihood of misunderstandings occurring during the survey process is increased, especially with a small sample size. Although the wording of the questions was specifically chosen to be understandable to people with Business English level language skills, it is possible that participants answered in a way that was not representative of their true feelings due to misunderstandings.

5.5 Future Research

This work was inspired by the seemingly contradictory evidence of the importance of service design methods, frameworks, or processes in manufacturing firms, where some studies found the use of these to be a factor in success, while others did not, but either way, companies were continuing to use *ad hoc* methods of service development. The concluding theory of this paper is that the use of methods, frameworks, or processes in service design can solve other challenges faced in service innovation, therefore future topics of research could include:

- methods to tackle cultural challenges in service innovation,
- designing in-house service design methods, frameworks, or processes that address specific challenges individual companies face in service innovation,
- making service design methods, frameworks, or processes more user friendly and increasing their usage and effectiveness,
- effects of methods, frameworks, or processes on non-financial success factors.

ATTACHMENT A - SURVEY

Campus 02 Master Thesis in Service Engineering and Management

Challenges and Roadblocks in Service Innovation

Thank you for participating in this questionnaire.

The subject of my Master Thesis is about the use of methods, frameworks, or processes for designing new services in manufacturing companies.

It does not matter if the new services are "traditional" services such as maintenace or helpdesk support, or if they are "digital or smart services" such as dashboards or monitoring, but the focus is on services which are sold to customers.

Please answer the below questions to the best of your ability.

Click the "Done" button at the end, when you are finished. If you do not come to a "thank you" page your responses were not saved.

Your identifying information (name, position/title, and company) will not be published in the Master Thesis but may be seen by various Campus 02 staff.

If you have any questions, please feel free to contact me.

Best regards,

Amanda Davidson

* 1. What is your name?

2. What is your title or position?

* 3. What is the name of your company?

* 4. Is the design of new services a part of your job responsibility?

- ◯ Yes
- ◯ No

* 5. In your company, how different is the design process for new *products* from the design process for new *services*?

- ◯ Completely different
- ◯ More different than similar
- ◯ More similar than different
- ◯ Completely the same
- ◯ I do not know

* 6. Does your company have documented methods, frameworks, or processes for designing new services?

- ◯ Yes
- ◯ No
- ◯ I do not know

* 7. How important are methods, frameworks, or processes for designing new services?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not so important
- ◯ Not at all important

* 8. How often do you use methods, frameworks, or processes for designing new services?

- ◯ Always
- ◯ Usually
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

9. What methods, frameworks, or processes do you use for designing new services?

* 10. What is your opinion about methods, frameworks, or processes for designing new services? Select all that apply.

- [ ] They are useful
- [ ] They are not useful
- [ ] They are flexible
- [ ] They are inflexible
- [ ] They help me to do my job
- [ ] They make my job more difficult
- [ ] I would prefer to use them
- [ ] I would prefer not to use them
- [ ] They fit my needs
- [ ] They do not fit my needs
- [ ] Management supports the use of them
- [ ] Management does not support the use of them
- [ ] I am confident using them
- [ ] I am not confident using them
- [ ] I am not sure how I feel about them
- [ ] Other (please specify)

* 11. Have you had training (internal or external from your company) on designing services?

- ◯ Yes
- ◯ No

12. If you have had training, how useful was it?

- ◯ Extremely useful
- ◯ Very useful
- ◯ Somewhat useful
- ◯ Not so useful
- ◯ Not at all useful

Other (please specify)

* 13. Which sentence do you *most* agree with?

- ◯ Using service design methods, frameworks, or processes *solves* challenges or roadblocks in service innovation.
- ◯ Using service design methods, frameworks, or processes *creates* challenges or roadblocks in service innovation.
- ◯ Using service design methods, frameworks, or processes *has no effect* on challenges or roadblocks in service innovation.

* 14. What are the **3** biggest challenges you face in service innovation? ***Please select ONLY 3.***

- ☐ There is not enough collaboration between internal departments
- ☐ The company is not agile enough to handle change and keep up with customer demands
- ☐ Employees do not have the right knowledge or training
- ☐ A strategy for service innovation does not exist, or is not clear
- ☐ The customer should be more involved in new service design
- ☐ A service design process is not used in my company, or is not clear
- ☐ Service innovation does not have enough financial resources
- ☐ There is not enough management support for the development of new services
- ☐ Other (please specify)

15. Are there any additional details that you would like to add to any of your answers above?

16. Is there anything else you would like to say about service innovation or the design of new services?

* 17. If necessary, would you be willing to answer follow up questions?

- ◯ Yes
- ◯ No

LIST OF ABBREVIATIONS

NPD - New Product Design

NSD - New Service Design

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REFERENCES

Bettencourt, L. A., & Brown, S. W. (2013). From goods to great: Service Innovation in a product-dominant firm. *Business Horizons, 56*(1), 277-283.

Bettencourt, L. A., Brown, S. W., & Sirianni, N. J. (2013). The secret to true service innovation. *Business Horizons, 56*(1), 13-22.

Bullinger, H.-J., Fähnrich, K.-P., & Meiren, T. (2003). Service Engineering—Methodical Development of New Service Products. *International Journal of Production Economics, 85*(3), 275-287.

Concalves, A. P., & Saco, R. M. (2009). The New Wave of Innovation: Service Design. *International Journal of Innovation Science, 1*(1), 51-59.

Costa, N., Patrício, L., Morelli, N., & Magee, C. (2018). Bringing Service Design to manufacturing companies: Integrating PSS and Service Design approaches. *Design Studies, 55*, 112-145.

de Brentani, U. (1991). Success Factors in Developing New Business Services. *European Journal of Marketing, 25*(2), 33-59.

de Brentani, U. (1995). New Industrial Service Development: Scenarios for Success and Failure. *Journal of Business Research, 32*, 93-103.

de Jong, J. P., & Vermeulen, P. A. (2003). Organizing Successful new service development: a literature review. *Mangement Decision, 41*(9), 844-858.

Dörner, N., Gassmann, O., & Gebauer, H. (2011). Service Innovation: why is it so difficult to accomplish? *Journal of Business Strategy, 32*(3), 37-46.

Ebeling, J., Friedli, T., Fleisch, E., & Gebauer, H. (2014). Strategies for Developing the Service Business in Manufacturing Companies. *Servitization in Industry*, 229-245.

Ehrenhöfer, C., Kreuzer, E., Aschbacher, H., & Pusterhofer, J. (2013). How to Change Business in the Age of Service Science. *QUIS13-Service Excellence in Management* (pp. 258-267). Karlstad Sweden: CTF, Service Research Center, Karlstad University, Sweden.

Gebauer, H., & Friedli, T. (2005). Behavioral implications of the transition process from products to services. *Journal of Business & Industrial Marketing, 20*(2), 70-78.

Gebauer, H., Bravo-Sanchez, C., & Fleisch, E. (2008). Service strategies in product manufacturing companies. *Business Strategy Series, 9*(1), 12-20.

Gebauer, H., Fleisch, E., & Friedli, T. (2005). Overcoming the Service Paradox in Manufacturing Companies. *European Management Journal, 23*(1), 14-26.

Gebauer, H., Friedli, T., & Fleisch, E. (2006). Success factors in achieving high service revenues in manufacturing companies. *Benchmarking: An International Journal, 13*(3), 374-386.

Gebauer, H., Krempl, R., & Fleisch, E. (2008). Service development in traditional product manufacturing companies. *European Journal of Innovation, 11*(2), 219-240.

Gebauer, H., Krempl, R., Fleisch, E., & Friedli, T. (2008). Innovation of Product-related Services. *Managing Service Quality, 18*(4), 387-404.

Gremyr, I., Löfberg, N., & Wittel, L. (2010). Service innovations in manufacturing firms. *Managing Service Quality, 20*(2), 161-175.

Gremyr, I., Witell, L., Löfberg, N., Edvardsson, B., & Fundin, A. (2014). Understanding new service development and service innovation through innovation modes. *Journal of Business and Industrial Marketing, 29*(2), 123-131.

Groysberg, B., Lee, J., Price, J., & Cheng, J.-J. (2018, January-February). The Leader's Guide to Corporate Culture. *Harvard Business Review*, 44-52.

Holmlid, S., & Evenson, S. (2008). Bringing Service Design to Service Sciences, Management and Engineering. In B. Hefley, & W. Murphy, *Service Science, Management and Engineering Education for the 21st Century* (pp. 341-345). Boston, MA: Springer.

Jaakkola, E., & Hallin, A. (2018). Organizational Structures for New Service Development. *Journal of Product Innovation Management, 35*(2), 280-297.

Jaakkola, E., Meiren, T., Witell, L., Edvardsson, B., Schäfer, A., Reynoso, J., . . . Weitlaner, D. (2017). Does one size fit all? New service development across different types of services. *Journal of Service Management, 28*(2).

Kelly, D., & Storey, C. (2000). New Service Development: initiation strategies. *International Journal of Service Industry Management, 11*(1), 45-62.

Kim, S. K., Ishii, K., Breiter, K. A., Naoshi, U., & Kyoya, Y. (2010). Design for service innovation: a methodology for designing services as a business for manufacturing companies. *Intl. J. Services Technology and Management, 13*(1/2), 40-62.

Kindström, D., & Kowalkowski, C. (2009). Development of industrial service offerings: a process framework. *Journal of Service Management, 20*(2), 156-172.

Kindström, D., & Kowalkowski, C. (2014). Service Innovation in product-centeric firms: a multidimensional business model perspective. *Journal of Business & Industrial Marketing, 29*(2), 96-111.

Kreuzer, E., & Aschbacher, H. (2011). Strategy-Based Service Development for Small and Medium Sized Enterprises. *Lecture Notes in Business Information Processing*, (pp. 173-188).

Kreuzer, E., Schäfer, A., & Aschbacher, H. (2011). The Concept of Service Strategy Scorecard- and Integrated Approach for Lean Service Engineering and Service Improvement: Theoretical framework and implications for Service Science. *Proccedings of the 2011 Naples Forum on Service- Service Dominant Logic, Network & Systems Theory and Service Science.* Naples, Italy.

Martin, C. R., & Horne, D. A. (1992). Restructuring towards a Service Orientation: Strategic Challenges. *International Journal of Service Industry Management, 3*(1), 25-38.

Martin, C. R., & Horne, D. A. (1993). Service Innovation: Successful versus Unsuccessful Firms. *International Journal of Service Industry Management, 4*(1), 49-65.

Martinez, V., Bastl, M., Kingston, J., & Evans, S. (2010). Challenges in transforming manufacturing organizations into product-service providers. *Journal of Manufacturing Technology, 21*(4), 449-469.

McDonough III, E. F., Zack, M. H., Lin, H.-E., & Berdrow, I. (2008). Integrating Innovation Style and Knowledge into Strategy. *MIT Sloan Management Review, 50*(1), 53-58.

Mendes, G. H., Oliveria, M. G., Gomide, E. H., & Nantes, J. F. (2017). Uncovering the structures and maturity of the new service development research field through a bibliometric study (1984-2014). *Journal of Service Management, 28*(1), 182-223.

Neu, B. A., & Brown, S. W. (2008). Manufacturers forming successful complex bsuiness services: Designing and organization to fit the market. *International Journal of Service Industry Management, 19*(2), 232-251.

Neu, W. A., & Brown, S. W. (2005). Forming Successful Business-to-Business Services in Goods-Dominant firms. *Journal of Service Research, 8*(3).

Nuutinen, M., & Lappalainen, I. (2012). Towards service-oriented organisational culture in manufacturing companies. *International Journal of Quality and Service Sciences, 4*(2), 137-155.

Oliva, R., & Kallenberg, R. (2003). Managing the Transition from Products to Services. *International Journal of Service Industry Management, 14*(2), 160-172.

Oliva, R., Gebauer, H., & Brann, J. (2012). Separate or Integrate? Assessing the impact of separation between product and service business on service performance in product manufacturing firms. *Journal of Business-to-Business Marketing, 19*(4), 309-334.

Ostrom, A. L., Bitner, M. J., Brown, S. W., Burkhard, K. A., Goul, M., Smith-Daniels, V., . . . Rabinovich, E. (2010). Moving Forward and Making a Difference: Reserach Priorities for the Science of Service. *Journal of Service Research, 13*(1), 4-36.

Parida, V., Sjödin, D. R., Wincent, J., & Kohtamäki, M. (2014). Mastering the Transition to Product-Service Provision: Insights into Business Models, Learning Activities, and Capabilities. *Research Technology Managment, 57*(3), 44-52.

Parris, D. L., Bouchet, A., Peachy, J. W., & Arnold, D. (2016). Change is hard: overcoming barriers to service innovation. *Journal of Services Marketing, 30*(6), 615-629.

Pereira, G. M., Rocha, M., Nunes, F. L., Borchardt, M., & Viegas, C. V. (2018). Internal elements that hinder a better industrian service offering. *Journal of Business & Industrial Marketing, 33*(2), 220-227.

Pezzotta, G., Sassanelli, C., Pirola, F., Sala, R., Rossi, M., Fotia, S., . . . Mourtzis, D. (2018). The Product Service System Lead Design Methodology (PSSLDM). *Journal of Manufacturing Technology Management, 29*(8), 1270-1295.

Shostack, G. L. (1984). Designing Services That Deliver. *Harvard Business Review, January-February*, 133-139.

Shulver, M. (2005). Operational loss and new service design. *International Journal of Service Industry Management, 16*(5), 455-479.

Stickdorn, M., & Schneider, J. (2011). *This Is Service Design Thinking.* Amsterdam: BIS Publishers.

Stuart, F. I. (1998). The influence of organization culture and internal politics on new service design and introduction. *International Journal of Service Management, 9*(5), 469-485.

Tax, S. S., & Stuart, I. (1997). Designing and Implementing New Services: The Challenges of Integrating Service Systems. *Journal of Retailing, 73*(1), 105-134.

Uchihira, N., Kyoya, Y., Kim, S. K., Maeda, K., Ozawa, M., & Ishii, K. (2008). Analysis and Design Methodology for Recognizing Opportunities and Difficulties in Product-based Services. *Information Processing Society of Japan, 49*(4), 1549-1562.

Ulwick, A. W., & Bettencourt, L. A. (2008). Giving Customers a Fair Hearing. *MIT Solan Mangement Review, 49*(3), 62-68.

Wise, R., & Baumgartner, P. (1999, September-October). Go Downstreatm: The New Profit Imperative in Manufacturing. *Harvard Business Review*, 89-96.

Wittel, L., Edvardsson, B., Meiren, T., & Schäfer, A. (2016). New Service Development in Manufacturing Firms- Similarieties and Differences with New Service Development and New Product Development. *The Journal of Applied Management and Entrepreneurship, 19*(3), 35-49.

Zomerdijk, L. G., & Voss, C. A. (2011). NSD Processes and Practices in Experiential Services. *Product Development & Management Association, 28*, 63-80.